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ABOUT THE COVER...
The painting on the cover, titled ‘Let’s Protect Our Earth To Make A Better World For Children’, is done by 13-year-old William Christian from Indonesia. This is extracted from the book Children Map The World (copyright of International Cartographic Association). The maps in this book are submissions to the bi-annual Barbara Petchenik Children’s Map Competition, run since 1993. The next competition is this year (2009) and the rules for the same can be found at http://lazarus.elte.hu/ccc/ccc.htm.
At Speck, it has always been our endeavour to make an impact in the lives of the people. Diligently following our credo of “Innovate to Empower” we seek to make technology relevant in a manner that touches the life of every citizen opening the doors to a better world.
In 1969, Ian McHarg, a professor of Landscape Architecture at the University of Pennsylvania wrote a seminal work entitled "Design with Nature" in which he outlined how anthropomorphic activity needs to seek unity with nature and not conquest. This text became a widely referred book on landscape architecture and landuse planning. The basic concepts outlined in the book laid the foundation for the development of Geographical Information Systems. McHarg’s contribution was the development of multi-criteria decision models to solve complex environmental issues involving engineering and social factors, which were often seen to be at cross purposes.

Today, the world stands at a historic junction, poised to soar into a glorious future or descend precipitously into the oblivion brought on by global warming and a reckless destruction of the very environment that nurtures us. Sustainability of Planet Earth is the core issue.

Unfortunately, issues of sustainability have been all but overwhelmed by the unsustainability of economic growth and the world is spiralling into economic depression. And yet, in these troubled times we see signs of sanity. President Obama has set in motion plans to reduce the dependence of the United States on imported oil. Development of alternate and hopefully, renewable and cleaner energy will get a boost. However, a sobering thought is that replacement of oil can be costly. The world consumes a cubic mile of oil a year. To replace the energy equivalent of a cubic mile of oil we would need to build one hundred and four coal fired plants per year for fifty years! What will India and China do? Both these countries are sitting on enormous reserves of coal which happens to be the most abundant and cheapest but dirtiest energy resource of all.

I believe these factors, economic depression and global warming, open up opportunities for the geospatial industry. A slow down in the economy gives time for industry to stop and think about their future. Clearly, untrammelled growth is not the way. Investment in green technologies will be essential. Governments will have to initiate new policies which are both economy-friendly and environmentally benign. Industry will have to evaluate and choose from many alternative technologies. A study for the US NSDI shows that collection and processing of geospatial data could create jobs in many ICT and related fields. Further, a strong and comprehensive database could then be used to plan out future activities like the search for alternate energy, sustainable urban design, green infrastructure, environmental management, natural resources management, health, security, disaster management and e-governance; all of which would promote the sustainability of planet earth.

This is therefore a good time for countries to start creating their spatial data infrastructures or, if they already exist, to strengthen them. The need is to create a ‘system of systems’ by integrating and networking existing information infrastructure and adding value to it by developing robust planning models which use the data archived. There is something in it for everybody, be it industry, academia, the NGO or the government. We need to turn the adversity of the economic downturn into an opportunity to address those issues which get swept aside in the rush of development.
**NIGERIA**

**Street finder for Lagos**
A group of Nigerian information technology and map experts have developed an online interactive street finder for Lagos. The website MapNTL.com allows users to search for any street in Lagos, in addition to the location of any business by name and address. According to the initiators, the innovation was aimed at bringing the benefits of digital technology to the door steps of Nigerians, adding that the website could be described as the Nigerian version of Google maps website. Ireti Ajala, one of the initiators, informed that the website can show precise location of over 50,000 businesses in Lagos including banks, ATMs, restaurants, hotels, post offices, shopping plazas, markets, etc. The site’s database contains over 400,000 routable Lagos digital streets measuring over 5,400km in length.

**CHINA**

**3D version of Great Wall to be online**
China will create a three-dimensional digital version of the surviving sections of the Great Wall, which the public will be able to view online, informed the State Bureau of Surveying and Mapping. The digital version will be constructed from data obtained through a near-finished photographic mapping of the sections in nine provinces, autonomous regions and municipalities in northern China, the bureau said. The Great Wall was originally built by China’s first emperor Qin Shi Huang but most of the surviving walls that are visited today were built by the Ming Dynasty, about 600 years ago.

**Chinese version of “Google Earth”**
The State Bureau of Surveying and Mapping (SBSM) recently launched a programme to set up a service platform on national geographic information for the general public.

The move is said to have marked fundamental changes in China’s traditional services to supply basic geographic information. Upon completion, the programme will provide comprehensive online geographic information services similar to “Google Earth” and “Google Maps” to all types of institutions and to the general public.

**CIST bags $28.2mn worth of contracts**
China Information Security Technology, Inc., (CIST) has announced that its newly signed contracts in the fourth quarter of 2008 were valued at $28.2 million, an increase of over 5.4%, compared to contracts signed during the third quarter of 2008. Of these contracts, 58% were won in the GIS sector, 22% in the information security technology sector, and 20% in the product sales and services sector.

The company won contracts from 2 new cities in the fourth quarter, bringing the total number of cities in which it has a presence in China to 26.

**INDIA**

**Exclusive satellite for climate to be launched**
Indian Space Research Organisation (ISRO) chairman G. Madhavan Nair has said that after the success of Chandrayaan 1, ISRO is going to launch an exclusive weather satellite jointly with the French space agency CNES (Centre National d’Etudes Spatiales) in 2009. The satellite, named ’Mehga Tropiques (MT)’ will study the tropical atmosphere and its associated phenomena and would help India and France to study the cyclones, monsoon and other changes. The MT satellite payloads are high-technology sensors, viz. Microwave Analysis and Detection of Rain and Atmospheric Structures (MADRAS), a millimeter wave humidity profiler, SAPHIR, and an optical-IR radiometer for radiation budget (ScRaB).

**Satellite to aid sea fishing**
ISRO also plans to launch OceanSat-II with a view to help sea fishing. According to an ISRO official, “The OceanSat-II will have better capabilities than the OceanSat-1 launched in 1999. The OceanSat-II will have two instruments - ocean colour monitor and
scatterometer. The ocean colour monitor would detect the colour of the ocean indicated by phytoplankton. The scatterometer will study the interaction between ocean and atmosphere, sea surface temperature, wave height and this information will help the weathermen in forecasting the weather.”

**Tridex launches 3D laser scanning services**

Tridex Solutions has launched its real world 3D scanning solutions in India. The scanning activity of the company involves capturing of real world data, modelling and visualisation through use of laser scanning survey technology. According the company’s press release the tedious and costly practice of field surveying has now been made obsolete with the advent of what Tridex has labelled as “Desktop Surveying”. Tridex has setup strategic data processing center in STPI area, Gurgaon. The company has its headquarters in Salt Lake City, USA.

**Rolta acquires Piocon Tech**

Rolta has acquired Piocon Technologies, a Chicago-based firm that has customers in oil and gas sector. The acquisition gives Rolta access to solutions that address critical operational needs of refineries. Currently, all of Piocon’s customers are based in the US and Rolta plans to expand this to the Middle East and India, CMD KK Singh said.

**eSpatial, RSI Softech enter into reseller agreement**

eSpatial and RSI Softech announced the signing of an exclusive Reseller Agreement. Under the agreement, RSI Softech will act as master distributor for iSMART, eSpatial’s geospatial software suite for development of integrated, enterprise grade spatially
enabled applications, throughout the Indian market. iSMART supports a number of deployment models which include Pure Web and Customised Client within a scalable, role-based and secure environment. RSI Softech specialises in providing enterprise geospatial solutions.

ISRAEL

Satellite images to help tackle sea piracy menace

The Israeli company-operator ImageSat International N.V. has utilised highly-detailed small satellite EROS B to receive a series of images with spatial resolution of up to 0.7 m featuring the area offshore Somalia where vessels seized by pirates are clearly seen. The company ImageSat Int. provided ScanEx RDC with satellite images showing villages and bases of pirates on the coast of Somalia, moorings of their speed-boats and motorboats. The capabilities of the up-to-date EROS B satellite hardware allow detection of the entire infrastructure of the Somali pirates.

Web-to-mobile 3D aerial photo navigation

3DVU has launched a personalised online Web-based navigation planner named Way2Go. Offered in combination with free mobile viewer of 3D aerial photography with real landscape elevation, this on-board navigation would allow people to plan their journey on their PC or notebook and synchronise it with their mobile device, giving access to 3D picture routes and favorite destinations while on the move. Way2Go will be available for mobile users with Symbian S60 devices including Nokia’s popular phones, hundreds of Windows Mobile models like Samsung, HTC, and Motorola, providing geo-coverage of the entire USA, UK and major Western European countries including Germany, Holland, France and Czech Republic. Similar to a calling card, Way2Go subscribers prepay $4.99 per month for the web based route planning, cutting and synchronising of up to 30 routes (up to 3,000 km in total) where the mobile 3D viewer is free to all.

PHILIPPINES

City bodies adopt DENR-NAMRIA GCPs

The local government units (LGUs) of Southern Leyte recently firmly up their partnership with the Department of Environment and Natural Resources (DENR) and the National Mapping and Resource Information Authority (NAMRIA) as the various municipal mayors entered into a Memorandum of Agreement (MOA) aimed at ensuring the protection and conservation of the Geodetic Control Points (GCPs) through adoption.

Subject for adoption are the 237 GCPs that were initially established as well as the old GCPs that were recovered and reobserved in the different barangays (administrative unit) of the municipalities of Southern Leyte from year 2007 and 2008.

RUSSIA

Geoportal for Volgograd region

Committee for Information Technologies and Telecommunications with Volgograd Region Administration has taken up the task of managing a geoportal meant for handling geospatial data related to the territory of the Volgograd region. The geoportal, based on ScanEx’s Web GeoMixer, is aimed to provide access to geospatial data for citizens, economic entities, state power authorities, local authorities as well as to raise the timeliness and efficiency of Volgograd Region executive power authorities.

It will eliminate the duplication in financing of activities for creation of spatial data and electronic cartographic materials of the Volgograd Region territory, to employ geoinformation technologies for the solution of tasks in different spheres. Currently the portal is being tested in the off-line mode.

TAIWAN

SuperGIS Server 1.0 Beta version for testing

SuperGeo will release the beta version of SuperGIS Server 1.0 for open testing. SuperGIS Server can integrate GIS data, varies GIS applied functions and services in the server. It also provides GIS data management, data visualise application, and spatial analysis for the end users’ need. The end users only need to install desktop or mobile application software and use Internet to connect SuperGIS Server to acquire data and functions from the server.
**UAE**

Trimble’s Doha show

Trimble Express, a show on surveying technology, was held in Doha recently to introduce high-technology land surveying products. This is the first time that this event, normally held in Europe, was organised in Middle East. The event attracted over 100 representatives from different market segments like the Public Works Authority (Ashghal), Qatar General Electricity and Water Corporation (Kahramaa), Urban Planning and Development Authority (UPDA), government bodies and major construction firms in Qatar. The event was organised in collaboration with BCL, Dubai-based Trimble dealer and BCL’s Doha partner Teyseer Industrial Supplies and Services (Tissco).

**Americas**

**CANADA**

Mobile laser mapper launched

Calgary-based Airborne Imaging has successfully tested an Anglo-German vehicle-mounted mobile laser mapper. StreetMapper 360, which is being supplied by UK-based 3D Laser Mapping, has been specifically designed for the rapid 3D mapping of highways, infrastructure and buildings using vehicle mounted lasers. Travelling at normal road speeds, StreetMapper 360 is claimed to offer a 360-degree field of view with high precision mapping to a range of 300 metres. It also captures details along the highway corridor including barriers, gulleys and overhead wires enabling surveyors create 3D computer models for new scheme planning, maintenance, wide load route assessment and post-incident investigations.

Satellite imagery for precision agric. campaign

Canadian precision agriculture consultancy DynAgra has completed its first precision agriculture campaign using DMCii satellite imagery to provide sophisticated agronomic tools to its customers.

DynAgra tasked DMCii with acquiring multi-spectral imagery of agricultural plots in the province of Alberta. DMCii provided the imagery in an orthorectified format that could be used immediately in their GIS applications. DMCii owns an operational constellation of 5 satellites, each of which is able to image a very large area in a given timeframe. DynAgra uses the imagery from DMCii along with crop models to produce maps showing the density of green biomass. The company’s experts then work with the farmer to map out management zones within the fields. The management zones are then further investigated by DynAgra’s team of agronomists and remote sensing engineers using GPS-enabled Personal Digital Assistants (PDAs) to locate the management zones and record additional information about the concentration of nitrogen, phosphorus, potassium, soil organic matter, pH and other soil characteristics. Once the required information has been compiled, DynAgra produces a geographically referenced fertiliser application map for farmers describing which fertiliser should be used, where and in what quantity.

**Safe Software releases new FME**

Safe Software has announced the release of FME 2009, claimed to be the only complete spatial data conversion and distribution solution available. This new version, which includes new releases of FME Desktop and FME Server, is claimed to match the recent trends emerging in the geospatial industry that have increased the demand for improved data interoperability. The features of the new release are-

- Offering new optimised platform that can process complex conversions on large volumes of spatial data. Based on test results, most conversions run approximately 20% faster than using previous versions.
- Support for more than a dozen emerging formats. Newly supported formats include Adobe Geospatial PDF, AutoDesk 3ds, CityGML, IBM Informix Spatial, OpenStreetMap (OSM) XML, and more.
- Latest user interface enhancements that make conversion of spatial data into required format and data model easier.

**Infoterra to distribute FME tech**

Infoterra Ltd has extended its portfolio of end-to-end geospatial products and services through an agreement with Safe Software Inc. to distribute FME from 1st January 2009. FME is the only complete spatial ETL (extract, transform and load) solution available for data conversion and distribution. It provides support for over 200 GIS, CAD, raster and database formats to enable seamless translation, transformation, integration and distribution of spatial data.
USA

Street level routing in Mexico

Rand McNally, with its new IntelliRoute Dock2Dock software has announced availability of street-level routing in Mexico. Carriers and shippers can now route on city and inter-neighbourhood streets throughout North America. Additionally, the company has enhanced its own proprietary data with datasets from NAVTEQ. These enhancements are claimed to provide more flexibility and customisation in freight rating and truck routing, more specific routing in Mexico, and the most up-to-date U.S. ZIP and Canadian postal codes, weigh stations and toll costs.

Sidwell to maintain Cleveland County’s cadastral data

Cleveland County, located in central Oklahoma, has selected Sidwell Company, Illinois, to convert their cadastral-based GIS data to ESRI’s ArcGIS Geodatabase platform and to provide an ESRI-based software solution for maintaining the cadastral GIS. Sidwell will convert Cleveland County’s current cadastral data into an enterprise geodatabase that utilises the cadastral tag data model. The company will perform design file data scrubbing services, conflation of coincident boundary lines and geospatial referencing of the mapping data to the county’s orthophotography. Cleveland county’s parcel number inventory will be imported into Parcel Builder-Administrator, which will enable the county to link parcel numbers directly to the GIS, thereby making them available for integration with tax and CAMA applications and for enhanced workflows.

$1 mn grant for CCIM Institute members

ESRI and CCIM Institute, the commercial investment brokerage and real estate network firm, have announced a $1 million U.S. grant programme. The programme has the provision

COGO urges establishment of geospatial subcommittees

The Coalition of Geospatial Organisations (COGO) has asked the Congress to establish subcommittees in the U.S. House of Representatives and Senate with jurisdiction over Federal geospatial activities. In a letter to House Speaker Nancy Pelosi (D-CA) and Senate Majority Leader Harry Reid (D-NV), COGO Chairman Cy Smith urged that oversight of geospatial technology be specifically included in the mission of existing Congressional sub-committees. (COGO) is a recently formed coalition of 15 national professional societies, trade associations, and membership organisations in the geospatial field.

The intent of the letter is to designate geospatial activities in the authority of an existing subcommittee in the House and Senate, respectively, said Smith. “We are not attempting to create new stand-alone committees, but we want to make certain that Congress has an effective structure for oversight and legislation over the increasing federal government activity in geospatial technologies, and its relationship with state, regional, local and tribal government, universities and the private sector,” said Smith. Smith is the immediate past president of the National States Geographic Information Council (NSGIC), an association of senior state GIS managers and coordinators, and is the Oregon State GIS Coordinator.

“Currently, responsibility for oversight and authorisation of federal geospatial activities is spread among more than 30 House and Senate committees and subcommittees. More than 40 federal agencies include geospatial activities as part of their mission. That scattered structure is very inefficient and does not contribute to strategic, coordinated policy and investments among the federal agencies. In fact, one of the outcomes of the Byzantine structure currently in place in Congress is the stove-piped structure in the federal agencies,” said John Palatiello, Executive Director of MAPPS, the association of private geospatial firms and the author of the resolution adopted by COGO to endorse the idea of House and Senate geospatial subcommittees.
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of allowing CCIM members to employ spatial analytics and geodemographic data to find solutions to the challenges they face in the real estate life cycle. As part of the programme, CCIM designee and candidate members are eligible to receive GIS software, data, and training from ESRI.

**GroundView Demographics, AnySite integrated**

Pitney Bowes (PB) MapInfo announced that AnySite, company’s mapping and reporting application, has been integrated with its GroundView demographic data. AnySite enables organisations to analyse trade area data effectively. Through the integration of GroundView, a data offering fuelled by The Gadberry Group’s MicroBuild household geodemographic data, AnySite users can make reliable and timely market analysis decisions. This includes retail, restaurant, real estate and financial services industries pinpointing where the most profitable customers are located and determine how to effectively market them with a higher level of accuracy and success. GroundView demographic data is updated quarterly, providing with the most recent U.S. household and population counts to identify trends and observe changes across all available geographies, including the block level.

**ESRI’s new licenses for small utilities**

Small utilities will have greater access to GIS technology as ESRI rolls out the Small Utilities Enterprise License Agreement (SU-ELA) programme. The programme offers utilities firms, unlimited deployments to desktop, server, Web, and mobile solutions of ESRI’s ArcGIS platform; maintenance and support for products; staff training; passes to ESRI’s User Con-

The lack of technology needed to explore and monitor vast regions of tropical rain forest has been a critical bottleneck for Earth scientists, conservationists, and forest managers. As a result, there is a limited understanding of the composition and function of these forests and how they are responding to clearing, invasive plants, climate change, and other threats.

Gregory Asner and his team at the Carnegie Institution’s Department of Global Ecology recently created a new approach, part of the Carnegie Spectranomics Project, which can determine the chemical and structural properties and even the diversity of species in unprecedented detail over broad swaths of rain forests from aircraft. In a commitment to support this new science of airborne forest ecology, the Gordon and Betty Moore Foundation has awarded Asner a $5.2-million grant to advance the instrument technology required to make rain forest exploration and monitoring a reality.

The new technology is called High-fidelity Imaging Spectroscopy (HiFIS). It is part of the Carnegie Spectranomics Project and a major improvement of instrumentation already established aboard the Carnegie Airborne Observatory (CAO)—a unique airborne mapping system that can inventory and probe rain forest vegetation over nearly 40,000 acres per day. The highly portable CAO is flown aboard a fixed-wing aircraft. It uses waveform LiDAR (light detection and ranging) system that maps the 3-dimensional structure of vegetation and combines it with spectroscopic imaging. By analysing many wavelengths of reflected light, this imaging reveals a forest’s biochemistry in beautiful 3-D maps. Though new and innovative, the system is reported to be lacking several critical features needed for the most detailed chemical and taxonomic mapping.

“This new technology will help us to capture previously hidden ‘chemical fingerprints’ of rain forest species. My hope is to take the science, conservation, and management of these diverse ecosystems to levels only imagined until now. It will be a new era in the rain forest research,” noted Asner.

The Carnegie Spectranomics Project plans to map rain forests in Africa, Southeast Asia, Amazonia, the Caribbean, and the western Pacific. The Moore-supported High-Fidelity Imaging Spectrometer sub-component will be developed at the Jet Propulsion Laboratory and integrated with the existing Carnegie LiDAR system to create the Airborne Taxonomic Mapping System, or AToMS.

**uPlay acquired by Callaway Golf**

Carlsbad-based uPlay, manufacturer of a device that helps golfers measure their shots, using aerial and satellite photography and GPS technology, has been acquired by Callaway Golf, also from Carlsbad. Financial terms of the acquisition were not disclosed.


**NavDog launches intelligent map search**

NavDog.com launched a new map search technology that uses intelligence to refine content and search results in real time. This newly developed technology is claimed to have powerful capabilities that are sought-after by online advertisers. NavDog has been into developing AJAX-powered mapping systems for years and this latest offering from NavDog is claimed to be the first ever consumer-facing map search that incorporates system intelligence into the user experience. This intelligence is based on NavDog’s new Geographic Business Intelligence Engine (GBIE), which is designed to process user actions in order to derive their intent. This derived intent is matched with relevant map content, which is then displayed to the user in real time through NavDog’s refined AJAX technology. The system builds upon each subsequent user action in order to further refine the content it returns to the user. The end result is a map that displays the object of the user’s map search, along with related supporting content through relationships between map items and their relevance to the user’s immediate interests. The site literally creates a unique mashup of map content every time a user interacts with it.

**National Geographic to launch Geotourism project**

National Geographic Society’s Center for Sustainable Destinations has joined organisations in Washington and Oregon to publicise the world-class natural and cultural attractions of the Central Cascades. As part of this, a community-based nomination process will be used to create a National Geographic “Geotourism MapGuide” for the region. The “Central Cascades” area designated for the map stretches from Mount Rainier National Park to Crater Lake National Park, including communities plus private and public lands in both states. The printed Central Cascades MapGuide will be available in September 2009. A parallel interactive Web site is also being developed. The pilot project seeks to contribute to the economic health of communities by promoting geotourism: tourism that sustains and enhances the geographical character of a place -- its environment, culture, aesthetics, heritage and the well-being of its residents.
mail alerts if and/or when a crime occurs near a location of their interest such as home, office, or school. Crime incident data is updated nightly and includes date, location, distance from citizen’s address, event identification number and a brief crime incident description.

OGC joins OSGeo to promote open standards

The Open Geospatial Consortium, Inc. (OGC) and the Open Source Geospatial Foundation (OSGeo) have signed a Memorandum of Understanding (MoU) to coordinate in advancing open geospatial standards (OGC’s mission) and open source geospatial software and data (OSGeo’s mission). The MOU provides for the assignment by OsGeo of up to six one-year Individual Memberships in the OGC. Memberships will be selected by OSGeo and are subject to OGC qualifications for Individual Membership.

Spectra Precision introduces new GNSS system

Spectra Precision has introduced EPOCH 35, a new GNSS system that uses GPS and GLONASS technology for cadastral, topographic, control, stakeout and other precision survey applications. EPOCH 35 includes a base, rover, field software, data collector, and radio. The system operates without line-of-sight between points, and can be used in any weather. Built especially for tough surveying conditions, the compact and lightweight EPOCH 35 GNSS system can handle drops, extreme temperatures, dirt, and water. In North America, the system operates with TDS Survey Pro field software. Outside the U.S., the system runs Spectra Precision Field Surveyor. For RTK surveying, the base system may include a choice of radio modems that provide either a long- or short-range data link from the base to the rover.

Garmin updates eTrex models

Garmin International Inc., a unit of Garmin Ltd., has released its eTrex Legend H and the eTrex Vista H - low-cost handheld navigators that include several new features considered vital for outdoor adventures. The units include a high-sensitivity GPS receiver, which makes satellite acquisition faster and helps ensure a solid lock, even in dense tree canopies or vertical canyons that hikers, hunters, and geocachers often experience. The eTrex Legend H and eTrex Vista H also feature a fast USB interface and 24 megabytes of internal memory for loading detailed topo maps from a computer. The eTrex Vista H includes an electronic compass and barometric altimeter as well. Both units contain a basemap of North and South America, containing major lakes, rivers, cities, interstates, national and state highways, railroads and coastlines, which can be viewed on the units’ high-contrast 2.4-inch (diagonal) grayscale screen.

nüMaps Lifetime allows for map updates

Garmin International Inc., a unit of Garmin Ltd., announced that it would offer nüMaps Lifetime, a single fee programme that enables customers to download the latest map and point of interest information every quarter for the life of their personal navigation device (PND). The updates include new points of interest, streets, and addresses. Customers can purchase a nüMaps Lifetime retail package through an authorised Garmin dealer or purchase directly online. The nüMaps Lifetime programme is valid for the life of the customer’s unit. The subscription is not transferable if the unit is sold, is not transferable to another compatible unit, and is valid as long as Garmin offers map updates for the particular PND model and map updates are available from Garmin’s applicable map data supplier.

Scenic Routes on NAVIGON’s PNDs

Rand McNally will supply its Scenic Routes and City
Guides for NAVIGON’s line of personal navigation devices (PNDs). NAVIGON is the first company in the GPS industry to partner with Rand McNally to provide this information to consumers. Scenic Routes provides more than 250 scenic routes and pre-planned trips with coverage in all 50 states and Canada for travelers searching for routes featuring the most beautiful vistas and landscapes. City Guides provide information on the best attractions and landmarks for more than 1400 US and Canadian cities. NAVIGON owners using the City Guides feature will have access to overviews of cultural attractions, family friendly activities and historic landmarks.

SPOT Image awarded GSA contract
SPOT Image Corp. has been awarded a contract from the U.S. General Services Administration (GSA) to sell SPOT satellite imagery and related products and services to federal, state and local government agencies at pre-negotiated rates. Offered under the GSA Information Technology (IT-70) Schedule, the new SPOT contract simplifies and accelerates the acquisition process for the multitude of government entities that rely on satellite imagery and derived products. Under the contract, nearly the entire catalog of SPOT products has been offered to the government users, including new and archived 2.5m D 20m standard SPOT images in a variety of scene sizes, geo-coded and ortho-rectified SPOTView custom mosaic products, reference 3D data sets, DEMs, SPOTMaps off-the-shelf mosaics, and vegetation data. The GSA offering also includes some special processing services as well as new and archived imagery from the Taiwanese FORMOSAT-2 satellite.

CRISP to sell GeoEye 1 imagery
GeoEye, Inc. has signed a multi-year agreement with the National University of Singapore (NUS) that allows the university’s Centre for Remote Imaging, Sensing and Processing (CRISP) to collect and sell Earth imagery and related products from its GeoEye-1 satellite. CRISP already has a seven year old agreement with GeoEye for the data products of company’s IKONOS satellite.

OGC server for climate change studies to be launched
The Open Geospatial Consortium (OGC), Australian Bureau of Meteorology (BOM) and the Open Source Geospatial Foundation (OSGeo) have announced that a Climate Change Integration Plugfest (CCIP) server would be launched at the FOSS4G conference, taking place in October 2009. CCIP is a server with multiple virtual machines providing a number of different geospatial Web services that implement the OGC’s open interface and encoding standards. It will be used in the coming months to demonstrate open Web-based geoprocessing at conferences, test-beds, classes and other events around the world.” explained Raj Singh, Director of Interoperability Programmes at OGC.

Clark Labs releases IDRISI Taiga
Clark Labs released the 16th version of the IDRISI GIS and image processing system. Among the major new features of the Taiga edition are the Earth Trends Modeler (ETM) and a suite of segmentation classification tools. ETM is specially designed for the analysis of image time series from earth observing systems. It includes a coordinated suite of data mining tools for the extraction of trends and underlying determinants of variability, and will be of special importance to scientists focused on ecosystem dynamics.
Google Earth tracks bird flu evolution

Google Earth (GE) has played an important role in the scientists’ research on how the avian flu virus is gaining resistance to antiviral drugs through evolutionary selection. Researchers from the University of Colorado at Boulder recently found that the avian flu, a subtype of influenza A known as H5N1, is evolving resistance to adamantanes, one of two classes of antiviral medications used to treat the flu. GE allowed scientists to map individual gene mutations in H5N1 as the virus spreads around the globe.

“Our mapping of a phylogeny based on full genome analysis of H5N1 into Google Earth shows that adamantane-resistant lineages have spread and emerged independently in various regions of South East Asia over a period of only four years,” the report states. The researchers have made their flu map available as a KMZ file, which is a geospatial data format used by GE.

Tele Atlas maps featured in new Mio devices

Tele Atlas and Mio Technology have entered into an agreement according to which Tele Atlas digital maps and content are to feature in all new Mio devices. Mio’s new GPS devices for North America - Mio Moov S556, Mio Moov S300, Mio Moov S500 and Mio Moov S700 - are pre-loaded with maps of the U.S. and Canada, more than 12 million points of interest (POIs), and text-to-Speech (spoken street names) in three languages, with additional languages available for download via the Mio More Desktop software. The devices also include Tele Atlas Brand Icons, which help enhance users’ navigation experience by visually representing the POIs of participating businesses as instantly recognizable logos.

Michael Gould joins ESRI’s Education Team

Michael Gould has joined ESRI as director of higher education. He will be focussing on promoting spatial literacy among students in all disciplines and also concentrate on supporting the implementation of GIS technology across academic and administrative departments. Gould is a Ph.D. in geography (GIS) and has 20 years of experience working in geospatial domain that includes areas of Spatial Data Infrastructures (SDI) creation; researching standards-based interoperability with the Open Geospatial Consortium, Inc. (OGC); and developing geospatial Web services.

Nanonavi integrated with nanofinders

Nanomatic recently presented the integration of its mobile social application, Nanonavi, with its devices called nanofinders. Nanonavi is a social application for consumers to plug in on social networks and download to their mobile phone. It mashes up all the relevant profile information of friends and family from every major social network to map to locations using GPS on any GSM network in the world. Consumers can stay connected with whole new information to share and receive, including real-time mapped locations, Geo-tagged photos or videos, and points of interest to show to friends across all major social networks so they can stay in contact via maps or satellite images. nanofinders work with all GSM carriers worldwide.

Trimble outs Nomad 800X series handhelds

Trimble has introduced the AT&T Inc. -enabled Nomad 800X Series computers. The series includes three new models of its outdoor rugged handheld computer that offer Wireless Wide Area Network (WWAN) functionality and integrated quad-band GSM cellular data transmission, digital photography and bar-code scanning in one device.

The Nomad 800X Series models use a built-in high-speed wireless data modem and AT&T’s nationwide EDGE network to allow users to communicate from the field to a central office or other location. Nomad 800X Series computer users can send and receive real-time data and SMS messages via a cellular network at speeds up to 1 Mb per second wherever cellular connectivity is available.

Screen shots of GE depicting spatiotemporal distribution of the S31N mutation
handheld computer also features bar-code scanning capabilities.

**Geocoding guide for users working on disease surveillance**

The North American Association of Central Cancer Registries (NAACCR), has announced the release of book titled "A Geocoding Best Practices Guide". The publication is aimed to serve as an authoritative source of information on the use of geocoding and GIS in cancer registries. The Guide is authored by Daniel W. Goldberg of the University of Southern California (USC) GIS Research Laboratory. The Guide is designed for a variety of users, including cancer registry staff, who design geocoding systems and geocode cancer data and researchers who use these data for public health research and practice.

**QCoherent releases free LiDAR viewer**

QCoherent Software announced the release of its free LiDAR viewer, LP Viewer. LP Viewer can load and visualise copious amounts of LiDAR data in the industry standardised LAS 1.0, 1.1, and 1.2 formats. Requiring a Windows operating system and a minimal hardware configuration, LP Viewer provides fast on-the-fly tinning, contouring, 3D, profile visualisations, and ease of operation. LP Viewer is installed with a Free LP360 Evaluation. The LP360 evaluation (including LP Viewer) can be downloaded from QCoherent Software’s web page, QCoherent.com.

**Azteca releases GIS-centric asset management system**

Azteca Systems, Inc. released Cityworks Server MMS, the web-based asset maintenance management system (MMS) built on ESRI’s ArcGIS Server and designed to complement Cityworks Desktop and Anywhere products. Cityworks Server MMS provides agencies an advanced and efficient way to enable staff throughout the enterprise. Cityworks Server MMS shares a common database with Cityworks Desktop and Cityworks Anywhere, allowing organisation a cross-compatible benefit of blending Cityworks solutions-browser and client/server - to best meet their specific needs.

**Google Maps adds public transit data in 50 cities**

Google Maps has announced the coverage of public transit data in 50 cities including London, Paris, and Tokyo. The addition of public transit data allows users to plan their routes based on public transportation options, enhancing the utility of the service.

**SALES (Application Support )**

- Diploma or Degree in Engineering with 2-5 Years Experience in Technical Selling and Application support of Surveying Instruments such as: Electronic Total Stations & GPS RTK Receivers
- Must have basic knowledge of the operating concepts of Total stations and GPS receivers.
- Must be able to independently demonstrate Total Stations, GPS RTK receivers.
- Should have basic knowledge on land surveying concepts

**SERVICE**

- Diploma or Degree in Engineering with 2-5 Years Experience in servicing of Surveying Instruments such as: Automatic Levels, Digital Levels , Electronic Total Stations & GPS RTK Receivers
- Should have knowledge of working with collimator, Base line test and other routine software used in testing Electronic Total station & GPS Hardware.
- Should have basic knowledge on land surveying concepts

Candidates with knowledge on any known brand of surveying instruments meeting the above requirement can also apply. The employment package offers long term career prospects which include an attractive salary, furnished accommodation, family status, company car, leave passage, gratuity, medical facilities etc as per company rules. There are training opportunities at Manufacturers facility.

Interested candidates meeting the specific requirement for the above position may send their detailed resume along with two recent passport size photographs within 15 days of this advertisement to the following address by post or by email.

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(Projects & Telecom Division)  
Bahrain Trading Co LLC  
Al Jaame Street, P.O. Box 169, Muscat - 100 Sultanate of Oman  
Email: ecloman@suhailbahwangu.com  
www.suhailbahwangu.com
GIS Development

nced the addition of public transit data in more than 50 cities around the world. The new Transit Layer is available as a choice under the 'MORE' button on Google Maps interface. Once selected, the Transit Layer will display public transportation routes for the area that user views. Google describes it as a "virtual metro map on top of Google Maps." It doesn't provide full schedules and routing details like Google Transit does, but it will show the transit lines in the area.

GISCI certifies over 3,000 professionals

With its December cohort of Certified GIS Professionals (GISPs), the GIS Certification Institute (GISCI) surpassed the 3,000 GIS professional milestone by nearly 200 individuals. As of December 28, 2008, there are 3,231 GISPs. The year started with an estimate of 600 new GISPs in 2008. During the last week of the year alone, GISCI received more than 700 applications for review.

Most of these individuals will be certified in January and February 2009. GISCI attributes the growth to better recognition of the credential by the industry, GISP-to-colleague networking, and the importance of properly defining GIS as a profession.

Pictometry, Chung Ang AeroSurvey sign agreement

Pictometry International Corp. has signed a new international technology license agreement with Chung Ang AeroSurvey, Co. Ltd, a Seoul-based aerial survey, geospatial and IT solutions company. Under the terms of the agreement, Chung Ang AeroSurvey will utilise Pictometry’s proprietary image capture and processing technology and market image libraries in the Republic of Korea. Other terms of the agreement were not disclosed.

Magellan releases Triton with updates

Magellan has announced the its new enhanced Triton software with an improved North American basemap (Topo USA). The new updates include:

- Ability to load/search 500 waypoints, trails with 5,000 track points, and 20 routes.
- Improvements like the ability to select unique trail colour in addition to other user-defined trail attribute definitions.
- The accuracy of location information has been updated with improvements in latitude, longitude, heading, bearing, distance, date, time, elevation and speed.
- Improvements made to the functionality of the electronic 3-axis compass and digital barometer. Two Triton models come equipped with sensors – the Triton 500 and the Triton 2000.

DigitalGlobe, AEgis launch 3D imagery solution

DigitalGlobe and the AEgis Technologies Group have jointly launched ImageScape, a rapid 3D imagery solution that will provide governments, enterprises and developers with the capability to create rich simulations of any location in the world. ImageScape can generate 3D virtual terrain models of the world’s landmass by integrating high-precision, accurate satellite and aerial imagery and Digital Elevation Models (DEM) with a flexible, lightweight viewer, which creates media-broadcast quality terrain models.

GeoEye-1 captures Obama Inauguration

GeoEye-1, the world’s high resolution commercial Earth-imaging satellite collected an image over the United States Capitol and the Inauguration of President Barack Obama. The image, taken from 423 miles in space, is the world’s highest resolution, colour satellite image of the inaugural celebration.

The image, taken through high clouds over Washington D.C., shows the monuments along the National Mall and masses of people between the Capitol and the Lincoln Memorial. Among the many interesting features in the image are the clusters of people gathered around large jumbotron screens.
Introducing the new UltraCamL medium-format digital aerial mapping camera. The UltraCamL delivers the same technical capabilities offered by large-format cameras—full mapping, matching, stereo capability and radiometric quality—but in a medium-format package and price.

- Collect high-resolution PAN, true color RGB and NIR in parallel
- PAN channel matching and stereo capabilities
- Reproduce a high level of detail with no blur due to FMC by TDI
- Extend investments in existing flight mounts and flight environments

Learn more about these tools that cut costs, streamline your work and make your company more efficient. Visit www.microsoft.com/ultracam/gisdev to see the UltraCamXp and the newly announced UltraCamL.

Serious tools for serious mapping projects.
Microsoft introduces Live Maps Finland

Microsoft has introduced Live Maps Finland, a release made possible by the continuous evolution of Virtual Earth. Chris Pendleton, Virtual Earth tech evangelist, revealed that Live Maps Finland managed to use almost exclusively the Virtual Earth platform. In this context, Finnish users now have access to Katu (Road Maps), Ilmakuva (Aerial imagery), and Lintuperspektiivi (Bird’s Eye imagery). Live Maps Finland comes with the 3D view, enabling users to access not only imagery, location, and road information related to specific destinations in Finland, but also three dimensional cities around the country. Thanks to the Bird’s Eye overlay capabilities, 3D view models can be overlaid with Virtual Earth’s Bird’s Eye imagery.

..and Live Maps Netherlands

Microsoft has also introduced Live Search Maps Netherlands. The website is already live, and is claimed to be offering a new perspective over the Netherlands. According to Microsoft, the website has at its heart almost exclusively the Virtual Earth platform.

Using 3D wireframe terrain topologies and high-resolution commercial imagery from DigitalGlobe’s ImageLibrary and satellite constellation, ImageScape users will be able to fly through virtual representations of desired locations at a full 1:1 resolution. ImageScape provides an interactive and easy-to-use environment for all levels of users, including robust mapping and measurements tools to enhance the 3D experience, celestial models for day/night effects, environment options for snow, smog and rain, together with simple integration and output to broadcast media video and geospatial products.

Fugro to perform GEOSAR mapping in South America

Fugro EarthData, Inc., has been awarded two contracts for high accuracy elevation mapping over parts of South America. With a combined value of USD 13 million, the contracts will be completed using Fugro’s exclusive GeoSAR airborne radar mapping system and are funded by the U.S. government. Data acquisition for the contracts is now underway; final deliverables are scheduled for July and October 2010 and will be used to update existing topographic maps in support of regional land management activities.

INDUS bags Deptt of Homeland Security’s contract

INDUS Corporation, a Federal Information Technology (IT) solutions provider, has won a contract with the Department of Homeland Security, U.S. Customs and Border Protection, Office of Border Patrol, to provide GIS. The contract has an estimated value of $4.5 million. INDUS is a privately held provider of IT and communications services meet-

Mississippi funds GIS s/w site license programme

The Enterprise for Innovative Geospatial Solutions (EIGS) and the Geospatial Council of the Institutions of Higher Learning (IHL) announced that the state of Mississippi has funded the geospatial statewide software site license programme for the 2008-09 academic year. The geospatial software programme provides remote sensing and GIS software learning packages for use at all Institutions of Higher Learning and Community and Junior Colleges at no cost to the individual institutions. The total cost for FY09 for the State of Mississippi is $260,000, including software and administrative expenses. The total product value for FY09 is almost $25 million. This value is the amount that would be charged for the software without the site license agreement, representing quite a substantial savings for the state.
BELGIUM

LuciadEarth launched

LuciadEarth, software targeted for defence applications, was launched at recently held DGI 2009 conference. The software has been specifically developed as a high performance, tile-based visualisation engine for virtually unlimited datasets in Command and Control environments. The technology is claimed to improve the Commander’s situational awareness to unprecedented levels by its ability to fuse raster and vector data of the entire Earth to any level of resolution. Combined with visualisation in 2D and 3D of the LuciadMap product suite, LuciadEarth is expected to open up new possibilities in surveillance, mission execution and real-time targeting.

FRANCE

Digital maps added to NEXTMap Europe

As part of its NEXTMap Europe programme, Intermap Technologies has made elevation data for the entire France commercially available. Uniformly accurate 3D DEMs and high-resolution orthorectified radar images are now available for the largest country (551,695 square kilometers) in the European Union. The new datasets include digital surface models (1 meter or better vertical accuracy) that depict the earth’s surface, digital terrain models displaying the bare earth (all cultural features digitally removed), and orthorectified radar images corrected to remove normal geometric distortions (grayscale and colour images that accentuate topographic features). The company has also recently made commercially available digital maps for Italy. An area of 301,318 square kilometers of Italy having varying terrain has been covered for the first time.

GERMANY

BEO to distribute RapidEye products

RapidEye announced that Beijing Earth Observation, Inc. (BEO), a subsidiary of Eastdawn Group, Inc., will be their Chinese distributor. The agreement between was signed recently between Eastdawn Group’s CEO, Bing Sun and RapidEye’s CEO, Wolfgang Biedermann. The contract makes BEO the only distributor of RapidEye’s satellite imagery in China.
HUNGARY

New mapping solutions from Nav N Go

Nav N Go has released new range of map data solutions for India, China, and Chile. The Chile data comes after the launch of Colombia and Argentina maps in 2008, and contains approximately 115,000 km of road and over 61,000 Points of Interest. The company announced the availability of its China mapping solution, based on Tele Atlas maps of Mainland China, Hong Kong and Macau. For India, Nav N Go has partnered with India-based MapmyIndia to offer the navigation map data for the country. The India map covers 202 cities at a detailed street level, over 600,000 km of roads connecting 130,000 towns and villages; and almost 450,000 POIs.

UK

Dotted Eyes, Autodesk partner on CAD and GIS

Dotted Eyes has become a reseller of AutoCAD Map 3D. The company is already the biggest PB MapInfo partner in the UK and a premier partner of Ordnance Survey. According to Dotted Eyes, the partnership with Autodesk would support the development of a consultancy-led model for integrating CAD and GIS software, the Unified Spatial Environment (USE). Among those to benefit from USE in the public sector will be business analysts and GIS professionals in local authorities, the National Health Service (NHS) and housing associations. They will find support for ensuring the accuracy of GIS projects through easier incorporation of CAD. At the same time, more traditional CAD users such as engineers, architects and designers can look to USE to help them query the kind of complex spatial issues.

MetaCarta’s solutions for 2012 Olympics

MetaCarta, Inc., has partnered with the British Transport Police (BTP) to help provide location based situational awareness for the 2012 Olympics. BTP will use MetaCarta geographic search and referencing solutions to geo-enable and consolidate information from multiple data sources by location and display it in MapView, BTP’s intranet visualisation tool. MetaCarta will geo-enable in excess of 1 million documents and documents from the BTP’s Memex law enforcement solution so that the information can be searched and mapped by location.
INDIAN INTERNATIONAL

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## EDITORIAL SCHEDULE ( YEAR 2009 )

**March – Design and Engineering**
The basic element of all design and engineering – CAD - and GIS, though differ in many aspects, share one major characteristic – they both deal with geometry. CAD and GIS systems provide information on and deliver representations of the real-world objects in each phase of the product lifecycle and there is an increasing tendency to integrate them. The edition will deal with several areas of application like design of infrastructure, visualisation, simulation and data collection where incorporation of geospatial technologies proved to cut costs and avoid design and engineering errors.

**April – Technology Convergence**
Remote sensing, photogrammetry, GIS, CAD, AM/FM and navigation were once different vertical segments. But now, these geo-enabled technologies are converging and their markets becoming horizontal. Developers are merging or fusing geospatial content like maps, earth images and 3D with other types of content in several ways to make new applications. Mashups, navigation applications, grid computing and cloud computing are just but a few examples in this direction. Technology convergence, market horizontalisation and information fusion are real phenomena today, and for sure will shape up the industry in the future.

**May – Energy**
Exploration, conservation of energy and search for alternative sources of energy are the need of the hour to achieve energy security for future generations. Geospatial tools offer technical and economic benefits for the energy sector, be it oil, gas, wind or other renewable and non-renewable sources of energy. The edition will feature the application of geospatial technologies in the exploration, production, distribution and efficient management of energy sources, their environmental impact and risk management.

**June – Governance**
Governance has taken a revolutionary path by incorporating technological developments including GIS in creating transparency, speed and convenience in processes, facilitating interaction between governments and citizens and enhancing revenues. Digital mapping technologies that enable geographical analyses proved to be effective decision making tools at all levels of governance. The edition will bring out the extended role of GIS in governance – be it local, state or central and how various governments utilise this technology in taking up and implementing various programmes pertaining to land, taxation, health, social infrastructure etc. in a bid to reach out to the public better.
CSR ships combined GPS/Bluetooth chip

Chipmaker CSR has introduced a device that integrates GPS and Bluetooth onto a single chip, which could drive up the number of handsets that include GPS as standard. The BlueCore BC7830, part of the BlueCore 7 family, is the first chip from CSR to have Enhanced GPS capability as well as Bluetooth v2.1 with high-speed enhanced data rate extensions.

Intergis introduces new Kuva

Intergis, is introducing the new Kuva, a configurable wireless asset tracking device for the construction and homebuilding industries. Kuva enables companies to track and protect high net worth assets including heavy equipment, vehicles, loads and cargo shipments using GPS/GSM system technology. On assets, Kuva is easily attached and immediately provides location, time /date and motion information which it then transmits to a remote server via the GSM/GPRS (General Packet Radio Service) wireless network. Users can track each transmission which appears in a web-based mapping or satellite imagery application, with the exact location of the asset being tracked. The data is integrated into the Intergis system or any number of logistics management technologies.

NAVTEQ expands global business with Microsoft

Microsoft Corp. has expanded its agreement with NAVTEQ under which Microsoft now has access to all 74 countries in the NAVTEQ map database. This multi-year agreement also allows Microsoft rights to utilise NAVTEQ content including Extended Listings, NAVTEQ Transport, NAVTEQ Discover Cities and NAVTEQ Voice. Microsoft will utilise NAVTEQ data in its Internet and mapping software solutions.

Mio announces Mio Spirit

Mio has launched its navigation software Mio Spirit that boasts of providing a simple and intuitive user interface (UI), an ‘Explore Mode’ presenting nearby all Points-of-Interest (POI) at a glance, and a ‘Capture Button’ to record favourite routes, locations, and voice memos. In order to develop the user-centric navigation software, Mio conducted international research to provide consumer insight through all age ranges, and found that most PNDs only focus on “going from place to place” and leave out the rest of a journey.

TomTom unveils connected GPS

GPS manufacturer TomTom has introduced portable navigation device, TomTom GO 740 Live. Similar to Dash Express and TeleNav Shotgun, GO 740 Live is a connected GPS using a built-in SIM card and GPRS modem. It comes preloaded with TeleAtlas maps of the US and Canada and includes text-to-speech functionality, voice recognition and commands, and integrated Bluetooth.

The unit features a 4.3-inch touch screen (supports 64,000 colors with a 480x272 pixel resolution) and measures 3.4 inches tall by 5 inches wide by 0.9 inch deep and weighs 7.9 ounces. The TomTom GO 740 Live is expected to ship in Q2 2009 for $499 and will be available at major retailers.

Telesoft launches LBS solution in India

Telesoft Technologies has announced the availability of flagship product, the HINTON Locator passive monitoring probe in India, which addresses the fast growing location-based services (LBS) and subscriber tracking applications markets. Connecting to any mobile network, it gives OEMs and system integrators the location-related signalling information that enables them to provide subscribers with geographically targeted applications.

Typical applications include location-based...
advertising, E911 services, info-point services and navigation aids.

**Autodesk to spin out its LBS business**

As part of a restructuring plan announced, Autodesk has signed a definitive agreement to spin out its Location Services business to Hale Capital Partners, a private equity firm. Autodesk believes this move will help position the Location Services business for greater success in the wireless industry, while allowing Autodesk to focus it on its core business. Details of the transaction were not disclosed.

**Ford selects TeleNav for in-car GPS**

Ford Motor Company will use TeleNav’s GPS navigation software in the new version of Ford’s in-car connectivity system, SYNC with Traffic, Directions and Information.

With this new version, users now have hands-free access to personalised traffic reports, precise turn-by-turn driving directions, and up-to-date information such as business listings, news, sports and weather. SYNC with Traffic, Directions and Information will expand this feature set to include voice-activated GPS navigation.

**Russia launches three new navigation satellites**

A Russian Proton-M rocket was launched into space with three new satellites for Moscow’s GLONASS navigation system, aimed at competing with US and European systems. The satellites were placed into orbit after the rocket blasted off from Russia’s Baikonur launch pad in Kazakhstan at 1043 GMT. The 1.4-tonne satellites join 17 others that are part of the GLONASS system, which Russia aims to finish next year. When completed, it will have a total of 24 satellites.

**Nokia to acquire bit-side to accelerate LBS developments**

Nokia and bit-side GmbH announced that an agreement has been signed for Nokia to acquire substantially all assets of bit-side. Bit-side is a privately owned Berlin-based professional services and software company with 39 employees. By acquiring bit-side Nokia will strengthen and accelerate its mobile development for Nokia Maps. Acquiring bit-side enables Nokia to offer consumers the world-leading mobile location applications, such as Maps, along with routing and navigation at an accelerated speed.
You have been actively talking about the de-bureaucratisation of science in the country. Can you give us more insights on this and how this is planned to be achieved under the current framework?

As the Ministry of Science and Technology is governed by the mechanisms and procedures of the Government of India, all the procedures of Finance Ministry apply to us. In many situations, we find that for emergent projects and projects of huge public importance, procedures involved to take the project forward results in enormous delays, many a times up to 2-3 years. We believe these processes should not be applicable to experiments and projects in the area of science and technology. For that reason, we have now passed a legislation and we have in place Science and Engineering Research Board (SERB). This Board will act as a single window of clearance. Since people of great eminence and secretaries of departments will be on the Board, informed decision making will be far more expeditious. This is just one small area of de-bureaucratisation.

Countries like the USA, UK and Europe have agencies similar to SERB which take decisions. We believe this kind of mechanism helps in taking decisions on significant and publicly relevant scientific projects much faster and science funding far more rational and effective. That apart, there are other areas in which we wish to de-bureaucratise the scientific community. For example, in the appointments procedure, we find that several of these appointments, say of directors, take place through the Union Public Service Commission (UPSC). This Commission comprises of eminent people but not necessarily those familiar with science and technology. The procedures involved under the UPSC take a long time and the result is that many of these directors could not be appointed for prolonged periods of time because there were natural procedural delays involved. We have got rid of that within the CSIR system. Now, for every director to be appointed, there will be a search committee and that committee will be appointed by us. That search committee will immediately advertise or do a search, pick up the best man and appoint him immediately. We have also tried to set up a mechanism within the ministry wherein if funding is to be given for particular projects, there are online procedures. People don’t have to go through filling up huge forms and endlessly wait for the movement of files. The approval of the project is also online. This is also de-bureaucratisation, similar to the Demat procedure in stock markets. The procurement processes are also online. Procedures which used to take long periods will now be done in a few months. These are some of the significant steps we have taken in the past five years. This will make the system far more efficient and effective and will get it away from the clutches of bureaucracy.

Kapil Sibal
Minister for Science and Technology and Earth Sciences
Government of India
While most of the advanced countries spend about 2% of GDP on research and development activities, India spends only 0.88%. Also, research in pure sciences has taken a severe beating with demand for industry-specific technology. It is refreshing to listen to the PM at the recent Science Congress that the government intends to give priority to research in basic sciences. What activities are being planned in this direction?

First of all, one should take the numbers with a little care. At the moment, our R&D expenditure as a percentage of GDP is 0.88%. When we came into the government, the total budget was about Rs 4 lakh crore and R&D spending was 0.88% of Rs 4 lakh crore. At the time of presentation of last budget, our budget was Rs 7.5 lakh crore. So, R&D spending was 0.88% of Rs 7.5 lakh crore. So, if you talk in terms of percentages, it is static at 0.88% but if you talk in terms of actual numbers, it is much larger. The share of R&D was much larger than it was when we came into power. That doesn’t mean we are happy. In countries like China, R&D spending is almost 1.3% of GDP and they want to make it 3% by 2018. Most countries are aspiring to invest up to 3% of GDP into R&D but many countries have not achieved that. Yes, there are a few countries that achieved 2-2.5%, which is enormous. Prime Minister Dr Manmohan Singh has made a statement in the National SCI-
ence Congress recently that he will keep his promise made earlier that by the end of 11th Five Year Plan, R&D spending will go up to 2% of GDP.

In India, if you look at R&D spent as a percentage of GDP, you will find that the contribution of public sector (government) is greater than that of the entire private sector put together. Our contribution is almost 70% while it is the other way round in the rest of the world. We hope that such a change will come from the expansion of the economy. Our liberalisation process started in the early 90s and you cannot expect the turn around of the economy in a short period of 17 years. As the economy expands, as the private sector’s role becomes more significant, you will find R&D in the private sector increasing and hopefully we would reach 2% of GDP. Remember, 2% of GDP is not public sector spending in the rest of the world. It is public-private sector spending. While the public sector has been able to meet with itstrait with destiny in India, the private sector is yet to do that.

In the aftermath of Mumbai attacks, there has been a debate (and even a PIL was filed) over the free availability of satellite imagery on the Web. What is your take on this? How to take on this technology misuse without compromising the security and sovereignty of the country?

This is the first attack of its kind. If you look at all terrorist attacks throughout the world, whether it is the 9/11 attack on Twin Towers in the US, blasts in UK or in Spain, you will notice that this is unique. Even in the 9/11 attack, the terrorist’s face was not seen. They were not ready to be confronted. They have always been clandestine and used weapons or instruments for destruction. But for the first time, we have seen a terrorist willing to be confronted. He has walked openly at Chhatrapati Shivaji Terminus (CST), killing people. The media did not know how to react. The government did not put in place any regulation because it did not expect such a thing to happen. When you are confronted with such situations, there needs to be introspection whether what is being shown on national television is something that can harm the interests of the State.

Talking about technology misuse, measures are being taken to effectively utilise the technology for security related issues. Technology can only be beaten by technology with emphasis on research and development of applications and geo-exploration tools to ensure that security is not compromised.

The next new IT revolution will not just be an IT revolution but will be an IT-GIS revolution. Because IT is very much at the heart of geospatial technology. medium of data or information sharing. It can be in 3D form, and the kind of use that it has is mind boggling. Because each consumer of information or user of that information can himself add value to that geospatial information not just for himself, for neighbours, for society or for the rest of the world. The expansion of geospatial technologies is unlimited subject of course to only security concerns. To that extent, a limited quantity has to be regulated far more strictly and effectively than data which is unlimited. Now, basic data ultimately has to be provided by the government. But the government does not have the wherewithal and the finances to provide all kinds of data and put it in the public domain because that requires collection of data in geospatial form, in 3D form, which cannot be done by the government alone.

I think the first thing to do is, through public-private partnership, collect geospatial data with the help of satellites, aerial photography and whatever else is required. Having collected the data, it should then be allowed to be used by the public at large. Now, how that is to be used, to what extent it can be used, in what areas it can be used, in what form it can be used/licensed, is something that needs to be regulated. So, we need a regulatory mechanism and so we proposed a geospatial regulatory authority. The form of the authority and the conditions under which it will allow...
Government is obligated to carry out activities for public good. Data collection is one such activity. Collecting data with tax payers' money and then asking them to pay for it is not justified.

licenses to be given for the use of data in private sector is something that will be formulated by the authority itself. I think different data will be put under different regulatory mechanisms. I would not like to comment upon the role of the regulatory authority at this point. We need not even call it a regulatory authority. It might be a facilitating procedure. Regulation implies some kind of control. But this is not an area where we are really looking for controls. It will be a facilitator of geospatial data. The issue now is with the committee of secretaries which will opine what should be the form and structure of the authority. The matter will then go to the Cabinet. We hope to get it done before the next general elections this year.

Q. It is felt in some quarters that an apex regulatory/enabling authority at the national level may not be able to serve the needs of the local community. Is the proposed legislation planning to have a nodal/enabling agency at least at the state level, if not at the local level, so that access to and use of geospatial information gets accentuated.

Geospatial data will be made available through this facilitating agency at the local level. We need to have a mechanism to ensure seamless flow of data right through district authorities. There should actually be two mechanisms. One mechanism should ensure the flow of data within the government.

For the last 60 years, we could not put digital maps in the public domain. There were enormous restrictions from the Ministry of Defence. We have got a breakthrough during this government, that's an achievement in itself. The beginning of opening up of the whole sector happened in this government. I am thankful to the then defence minister Pranab Mukherjee with whom I worked. Both of us have come to a conclusion that this is absolutely necessary and he kindly agreed despite some resistance. That's how we have been able to set up NSDI. That's how we have a map policy today. This is the first stage. The next stage is to be able to collect data. Data has to be collected in an appropriate form so that it can be used by the ultimate consumer and user. We have data in the scale of 1:25K but that doesn't cover whole of India. We have only 1:50K covering the entire country. But now from 1:25K, we need to come down to 1:10K and then to 1:1K scale in urban areas. That requires mapping. That requires the SOI along with other agencies with cadastral maps, giving accurate data and putting it in public domain. This requires public-private partnership. This will take, if we have to cover the entire country, 5-7 years if not 10. Once this is done, the real seamless flow of data will happen without any problem. If you expect all this to be done overnight, it is not possible as we are yet to collect the data.

Q. GIS is an effective tool for planning and informed decision making. DST has acknowledged this fact and trying to bring in awareness for the same in several ways. But we do not see GIS/geospatial technologies actually getting into the governance of the country. What is your perception of the same and what can be done to give 'spatial thinking' its right place.

For the last 60 years, we could not put digital maps in the public domain. There were enormous restrictions from the Ministry of Defence. We have got a breakthrough during this government, that's an achievement in itself. The beginning of opening up of the whole sector happened in this government. I am thankful to the then defence minister Pranab Mukherjee with whom I worked. Both of us have come to a conclusion that this is absolutely necessary and he kindly agreed despite some resistance. That's how we have been able to set up NSDI. That's how we have a map policy today. This is the first stage. The next stage is to be able to collect data. Data has to be collected in an appropriate form so that it can be used by the ultimate consumer and user. We have data in the scale of 1:25K but that doesn't cover whole of India. We have only 1:50K covering the entire country. But now from 1:25K, we need to come down to 1:10K and then to 1:1K scale in urban areas. That requires mapping. That requires the SOI along with other agencies with cadastral maps, giving accurate data and putting it in public domain. This requires public-private partnership. This will take, if we have to cover the entire country, 5-7 years if not 10. Once this is done, the real seamless flow of data will happen without any problem. If you expect all this to be done overnight, it is not possible as we are yet to collect the data.

Q. You have advocated the use of superior technology rather than compromising with indigenous technology.

Ultimately, we must move from the ordinary to become extraordinary. That is human endeavour. That's how parents look to their children and say that their kids should become better than themselves. That is every parent's dream. And if a nation is moving from being ordinary to extraordinary, and the greater the movement forward, the more the nation will prosper. The more extraordinary achievements we are able to accomplish, the more the public is able to reach higher levels of excellence and that will enable the country to become stronger. That is normal human endeavour - to move from where we are to where we should be. And where we should be is always higher than where we are. And if that is the normal movement of nature and human endeavour, why shouldn't it happen in the area of science and technology?
Infotech Enterprises Limited is a global IT Services provider offering Geospatial Information Services, Engineering Design Services, and IT Services. Infotech offers expert technology solutions to customers across diverse industries. Over the last 17 years, Infotech has achieved substantial domain expertise in providing Geospatial Solutions to Utilities, Telecoms and Governments. Infotech believes in providing expert solutions, delivering high quality consistently and building partnerships globally.

As a leading provider of Photogrammetry, Image Processing and Mapping solutions, Infotech provides expert and cost effective solutions to customers globally. Our project experience is unprecedented and includes delivering large mapping programs for several Govt. agencies in North America, Europe and Asia. With more than one million sq miles of imagery delivered, we have managed some of the largest civilian mapping projects ever undertaken.

Infotech Geospatial India Ltd. is a subsidiary of Infotech Enterprises Limited, focusing on providing comprehensive geospatial solutions to Government and Industry in India and Middle East. Our services include Photogrammetry, Data conversion, GIS development, Field survey, Consulting, Application development, and Managed services.

We help our customers use geospatial technology and data to improve the way they do business.
Evolution is a human instinct. Be it anthropological, intellectual or scientific, man’s craving for a better tomorrow remains unsatiated. The science which found its roots in understanding the earth and its resources has now evolved into being an omnipotent technology tool capable of redefining the contours of the world.

Geospatial technology initially focussed on collecting information through cartographic means to create a 2D map to depict the length and breadth of the land, its resources and national and international boundaries for administrative tasks. On the one hand, we have moved from digitising analogue maps to creating original digital data for specific uses and then on to creating generic data that can be used for a range of different applications. On the other hand, in the last one hundred years, the introduction of aerial imaging technologies has changed the face of cartography dramatically. Today, there is a glut of data in general and specifically, there is a broad range of remotely sensed high resolution data available. While traditional electro optical sources on board satellites are delivering data with a resolution of about half a meter, radar data produces resolutions of about one meter.

With airborne systems, optical resolutions of 10 cm are being achieved.

“Clearly these resolution changes improved the ability to map features which have traditionally required ground based surveying techniques,” says Brad Skelton, CTO, ERDAS. Concurring with him, BVR Mohan Reddy, CMD, Infotech Enterprises, says availability of high resolution data has practically demystified the map making processes and feature extraction from ortho-rectified high resolution satellite
imagery (HRSI) is gaining ground rapidly, reducing reliance on field-based operations.

Talking about the accuracy of data, we can’t but acknowledge the explosive innovation in acquiring precise geospatial information. The unanimous choice of all industry leaders for achieving precision is the use of laser scanning and mobile mapping technologies. Advocating laser scanning, Matt Ball, Editor, Vector 1 Media, says, “This is one technology that will quickly revolutionise surveying.” Asserting that laser scanning technology is growing at a rapid pace and that the market for the same will double in the next two years quoting Spar Research report, Lisa Campbell, Vice-President, Autodesk, says, “Ultimately, the growing level of detail will serve to enhance the resulting analyses and, in particular, help create very accurate visual models of the infrastructure and the world around us.” In this context, Don Corswell, President, Optech, points out that the complementarity of mobile and airborne mapping has turned out to be really fruitful. There are places where conducting air-borne survey becomes difficult, such as cities. The datasets obtained as a result of using a combination of both these technologies gives fantastic resolution on all aspects of the city, he argues.

However, security restrictions and government permissions will limit their adoption for some time, feels BVR Mohan Reddy. Once these restrictions are relaxed and procedures streamlined, end-users will be able to exercise judicious choice between available technologies, resulting in better return on investment (ROI), he opines.

Auguring a good demand for such technologies, Ed Parsons, CTO, Google Earth says, “There is huge potential for information products produced from the automated combination of aerial and terrestrial sensing, here LIDAR in particular has an important part to play in creating 3D city models.”

After the accuracy and resolution of data are taken care of by innovative sensor technologies, its currency has gained priority in the context of rapidly changing urban façade. Prof Josef Strobl of Salzburg University says, “Increasingly, we need to not only support mapping tasks, but primarily monitoring assignment. This means that multi-temporal or quasi-continuous flows of data are the foundation of change detection and triggering of database events.” Today, we don’t just collect data in two dimensions. The geospatial content is primarily moving from 2D to 3D and 4D and also we have been able to understand how architectural drawings or civil engineering data could form part of geospatial composition.

Drawing from these sentiments, Matt Ball says, “The quick and automated capture of 3D city data from mobile platforms are adding a great deal of realism and currency to geospatial exploration systems. The utility of these realistic environments will only increase and it’s just a matter of time before our urban areas are accurately captured on an ongoing basis at a high degree of digital reality.” Bringing out the importance of these realistic environments and the inclusion of indoor content, Mark Reichart, President and CEO, OGC, says, “It is now important to provide a level of detail about the indoor environment commensurate with our growing digital connection to the outdoor environment. Indoor location technologies are only now emerging, but I believe this will be a major ‘next generation’ trend for the community - providing comprehensive indoor ‘geospatial’ services for a range of indoor needs”. Collectively, all these advancements are fuelling an appetite for more and better geospatial information.
Converging technologies and integration with mainstream IT

The expansion of definition of what constitutes geospatial content is driven by tremendous innovation in the technologies used to generate them. Geospatial technologies grow with the technologies they depend on like faster processors, better displays, wireless networks, online databases, fixed and mobile sensors etc; they also grow new branches and spawn new hybrids as inventive minds seek new solutions.

Today, convergence is the key at the core of which is the ‘blurring of boundaries’ between GIS and CAD. GIS analyses the world as it is, based on observations and representations of reality. CAD looks ahead with a focus on planning, putting designs for future features on the map. “Combining representations of current realities with the (alternative) futures of CAD-based designs probably holds the most important potential regarding convergence,” opines Prof Josef Strobl. This trend is clearly visible as government agencies, utilities and other organisations adopt infrastructure modelling that is beyond a mere ‘3D shell’. "It delivers a visualisation with all of the intelligence we come to expect in a GIS and the precision engineering detail we find in CAD," says Lisa Campbell, VP, Autodesk. As CAD, facilities and geospatial site information exist in ‘stovepipes’ at each stage of a building’s or capital project’s lifecycle, virtually everything in our built environment costs more than it should to design, build, operate and maintain. Mark Reichardt advocates interoperable Building Information Models (BIM) to correct this situation.

The list of converging hardware and software technologies keeps growing: wireless networks, computing devices, storage devices, sensor webs, distributed processing, grid processing, modelling and simulation, data discovery, imaging, location technologies, semantic processing and others. We really ought to do all we can to facilitate the convergence of geospatial technologies with developments in these supporting technologies. "The technical boundaries that separate these technologies are often bridged by consensus standards that define open standards interfaces and encodings. Standards also lubricate commercial roll-out of new offerings, because customers appreciate ‘plug and play’ components they can use in new combinations to solve their problems," analyses Mark Reichardt.

The convergence of imagery and geospatial data tools is occurring within the enterprise and vendor communities as traditional geospatial software vendors are adding more imagery capabilities and imagery software vendors are adding geospatial capabilities. "This is a natural industry progression and both geospatial and imagery software vendors are pushing the capabilities to make the import and manipulation of imagery a more seamless experience," says Matt Ball.

What Google spawned was nothing short of the Great Awakening. The advent of Google Maps was not the ‘GIS killer’ or ‘killer app’; it was a GIS promoter, according to Directions Magazine. It was the platform that allowed more people to see the utility of geospatial information, and that sharpened the focus of the companies that birthed the technology in the first place. We only have to look at the birth of the map mashup to see what happened. Mashups do one thing very well. They link a map platform with geographically referenced data.

The availability of data, such as a Web service that results from the creation of geospatial standards, allows a simple display of information. From humble beginnings, a genie’s bottle opened and basic mashups begat mashups 2.0, 3.0, etc. Both old and new geospatial software companies have embraced the mashup and have found new ways, and new data sources, to display information.

Web GIS represents only one face of the convergence of technologies. Convergence can happen at device level, like GPS enabled cellular phones and GPS enabled PDAs for navigation; at data level, like maps and high resolution imagery at street level and at application interface level for mashups, says Prof AR Dasgupta. The convergence of geospatial technologies with the vast proliferation of mobile technology is opening up new vistas of business lines in popularly known fields of location based services. “This market has grown at a much faster rate than the rate of growth the last decade saw in mobile telephones,” explains KCM Kumar, CMD, Speck Systems.

While on the other hand, we have convergence of different geospatial technologies like GIS, GPS, imaging and surveying, on the other hand this group of geospatial technologies have also converged with mainstream IT technologies which have added to the processing and analytical capacities of geospatial tools. This has also enabled creation of such data structures which could be merged with datasets of other disciplines and ultimately help expand the utility of geospatial datasets in the mainstream development activities.

Substantiating this idea, Matthew O’Connell, CEO, GeoEye says, “All things digital are converging and they are ‘flattening’ the
globe. While the technologies behind these individual technologies are unique and distinct, the products they produce are digital and can be merged and applied in a geospatial environment to help customers in business and government solve challenging problems.

“What makes GIS different though is data,” asserts BVR Mohan Reddy. He says a ‘geo’ database is increasingly seen as the underlying single corporate view of an organisation’s assets. This is a fantastic outcome. The overall reason for nearly every IT solution - is to make a decision or support a transaction. “As technologies converge,” says Jeff Akers, President, CH2M HILL, “IT users can focus on solutions that support transactions or decisions. Success will be a business success rather than simply the success of making technology work because we can. We will make better decisions, we will process more transactions, we will go about our business with better clarity - and success will be in the commodity of our own business instead of sub-optimum solutions within technology instead of within solutions.”

Talking about emerging trends in convergence, Matt Ball says, “Some of the emerging trends in mainstream IT have broad implications for geospatial market. The first is open source software, which has a strong and growing footing in the geospatial arena that will continue to grow. In the broad IT market, open source is predicted to see continued growth, with some predicting that it will represent 40% of all software and IT jobs by 2020. The second is cloud computing, where ubiquitous access to data and processing power on remote servers is being fed by open platforms. GIS continues to deliver the tools for open services that will accelerate the adoption and importance of the cloud in coming years”. Predicting the future of convergence, Ed Parsons says complex geospatial functionality will disappear behind great interface design and brilliant process engineering in the numerous applications it will build. Applications apart, Christian Heipke of the University of Hannover feels there is lot of methodological similarities between image-related and GIS/vector-related issues. He foresees a further integration in this arena. Extending this idea to business domains, Brad Skelton says imagery is now an integral part of decision support systems and it is expected that access to these systems be universal. Tools and technologies are now under development which will provide on demand geo-processing beyond simply viewing imagery.

At the organisational level, GIS, which was once considered to be a niche technology, has now become a part of the IT strategy of several corporate CIOs, says Rajesh C Mathur, President, ESRI India. Many organisations are in the process of migrating their GIS to enterprise level implementation and integrating it with ERP, CRM, SCADA and other IT subsystems.

This development has also redefined the role and profile of GIS professionals. They not only need to be proficient in GIS and its applications but should also have a good understanding of IT tools like RDBMS and ERP. Acknowledging the fact that geospatial technology is becoming part of mainstream IT, Maj Gen R Siva Kumar, CEO, NSDI-India, infers, “The day is not far when IT will become a subset of GI.”
Impacts of global economic slowdown

It is a reality today that the world is passing through economic slowdown. Rather, let’s call it a phase of economic corrections. The ongoing economic corrections have affected the fundamentals of the economy as a whole and are not limited to one particular industry. Geospatial industry, being part of the global economy, is definitely affected. Let’s analyse the good and bad of economic slowdown by taking stock of the industry leaders’ opinions.

Notwithstanding fears of economic downturn, many industry leaders are actually quite optimistic about the health and growth of geospatial industry. Sample these -

- I am confident that the geospatial industry will slow in some sectors while remaining health if not vibrant, in others
  - Lisa Campbell
- During this economic slowdown, the geospatial industry may actually be positively affected
  - Brad Skelton
- India will continue to invest substantially into urban and rural infrastructural development and, in general, in developmental governance. In this scenario, geospatial technology will be the main enabler in bringing intended benefits to the stakeholders
  - BVR Mohan Reddy
- Geospatial information and technologies help organisations save money and increase productivity, so, despite the world economic slowdown, we have reason to be optimistic
  - Mark Reichardt

Taking a judicious stance, some feel this is a common process of business cycles. Perhaps the present cycle seems more pronounced than previous downturns, but this has happened before and will recover and will happen again. Analysing this aspect, Jeff Akers says, "In powerful 'up' cycles, I believe the industry has excess investment capacity and invests in technology decisions that 'might' prove to add value - and just like wildcating for oil, these investments can pay off with big dividends. With the downturn of the business cycle, we tend to demand real business results. This is an inevitable outcome, but is a real discriminator within technology between technologies that add value and technologies that are interesting, but not vital or valuable. I think the periodic contraction and the re-evaluation of true value added is like a ratchet to our business. It establishes a new proven, must-have technological floor - where value is added, everyone must adopt that technology to simply compete. And non-value-added technologies are weeded out leaving exactly what but only what we need for business success. It moves the technology forward below which we will never retreat because the business value to compete in a tighter world has been proven."

In the past, much of GIS spend was discretionary - hence the industry was vulnerable to economic slowdown. This is less of the case now. Elaborating on this, BVR Mohan Reddy says, "Much of the GIS expenditure has moved from capex to opex and is part of the essential day-to-day running of an organisation. Second, a lot of the upfront expenditure in terms of buying the underlying technology and capturing the data has been undertaken. There are also much better metrics around the benefits of using GIS and geospatial, which means RoI business cases can be better articulated and managed." This effectively means there will be impacts from the global slowdown, but not as bad as it could have been, he opines. Responding to the immediate cash crunch and financial crisis, governments across the globe sprang into action to take immediate corrective action to support their economies. One of the first things most of the governments have undertaken is increase government spending, particularly in infrastructure, to improve money circulation in the market. "Geospatial services, being one of the first activities to be undertaken in infrastructure development, these services should see substantial increase in the volume of business in the coming years,” asserts KCM Kumar.

Assessing the long and short of the implications of this downturn, it is felt in several quarters that the anticipated growth in engineering design, consumer markets like LBS and in ITES will get affected quite visibly in the short term. These industries are conscious and cautious towards investing in new technologies and might put new initiatives on hold for some time. This will limit the expansion of geospatial industry at this stage. Traditional and mainstream markets like utilities, governance, infrastructure, defence or land will slow down a bit in the short term but will not be affected too adversely. This presumption is based on the fact that most of the industries are looking at continuing their existing technological support systems and geospatial has already been a part of technology solutions for these sectors. Talking about long term implications, geospatial industry will not get affected adversely. Rather, it would be one of the few technologies that will find itself as an active partner in rebuilding the economy. Talking about the effects on high-resolution imagery market, Jill Smith says, “In tough economic times, efficiencies are sought and costs scrutinised closely. The return of invest-
Advantage, Geospatial Industry

Matthew O’Connell
Chief Executive Officer
GeoEye

The year 2008 was the worst in Wall Street’s history since the Great Depression. The Dow Jones was down 34 percent, S&P down 38 percent and Nasdaq down 41 percent, its worst trading year since the exchange was created in 1971. Globally, stocks were down 48 percent. In the US, investment banks Bear Stern and Lehman Brothers collapsed, 2.7 million employees in the financial sector were laid off, billions were drained from retirement accounts, the auto industry was near bankrupt and a Republican President effectively nationalised parts of the economy. Now a new US President is offering a stimulus package worth nearly a trillion dollar to boost the economy, create jobs and stop the slide.

Commercial remote-sensing industry is not immune to these market forces. There is concern that governments around the world, plagued by demands on their treasuries to provide support to banks and basic industries, may cut back on spending for vital information services, such as geospatial information. Companies focussed on local collection of data and geospatial information worry that local budgets may not sustain the same level of revenues as in recent years. And the market turmoil affects all publicly traded companies, even the strong ones. This business is not for the faint of heart, or for those easily distracted, or those who require instant gratification. Singer and humanitarian, Bono said, “The going rate for change is not cheap-big ideas are expensive.”

Having acknowledged the turmoil caused by the financial sector, one has to remember that there is some good news for our industry. The geospatial sector is somewhat insulated from the general economic malaise, especially those companies that provide crucial information to defence and intelligence agencies around the world. However, even those of us who have strong government contracts and increasing revenues, like GeoEye, are not immune to the unease resulting from the global economic turmoil. The continued terrorist activity around the world - even in Mumbai - has made it clear that we must continue to be vigilant. So, defence and intelligence agencies will continue to be steady consumers of geospatial information.

One may also see a bright spot for the US industry in the policies of President Obama. He has committed to upgrade US infrastructure as part of a massive stimulus plan. The American Society of Civil Engineers estimates that $1.6 trillion are needed to bring America’s infrastructure up to “good” by 2010. Every infrastructure project has a geospatial component or reference to a physical location on the surface of the globe. While creating jobs by upgrading the nation’s physical infrastructure, we can also create jobs by upgrading the nation’s digital infrastructure or what some have called a “digital stimulus.” It’s more transformative in the long run. Other governments around the world are focussing on infrastructure spending as a way to stimulate their economy as well.

A new report by the US-based Information Technology and Innovation Foundation presents the case of investing $ 30 billion in the United States’ digital infrastructure including health, information technology, broadband access and other innovations that will stimulate a new economy. Infrastructure such as roads and bridges are important; “pavement” is fundamental but so are “pixels” or spatial technology in a globalised and digital world. Growing world population will drive technology development and fuel the market. Last year marked the first time in human history that more people lived in urban areas than in rural ones. That means 3.2 billion people now live on about 2.8 percent of the Earth’s surface.

This trend will continue. Today, in any given minute in the US, 40 babies are born, in China it is 160 and in India it’s 280. The changing dynamics of population demographics and the natural competition for resources - complicated by the impact of climate change - will put tremendous pressure on governments at all levels to have the best possible information readily available in an enterprise fashion across all functions of government. Governments and companies in the 21st century are facing multiple challenges, so any technology that helps ease the pain and “bring order from chaos” is valuable.

Socrates is quoted as saying that, “Man must rise above the clouds and look back upon the Earth because only then can he understand the true nature of things.” We now have the tools to be able to do just that. Despite the turmoil in the economic sector, the world is more aware every day that geospatial information has the power to help our nations provide better lives for the world’s citizens and to help those nations do so more cost-effectively. So the future for our industry continues to be very bright and we are well-positioned to help solve some of the world’s most challenging issues.

Lisa Campbell expects business geographics for retail chains and restaurants to shrink as those industries see an overall slowdown in consumer spending globally. Meanwhile, Lisa feels, stalwart GIS customers like water and power utilities firms will still invest in these technologies. Indeed, for many utilities focussed on building new physical networks and adding capacity, the current slowdown in real estate growth offers an opportunity to redirect their budgets to IT and automation. According to Matt Bali, there seem to be no immediate plans for cutbacks in military spending, making geospatial intelligence a continued bright spot for the geospatial market. In fact, he feels the increased
The essence of geospatial technology is all about mapping the earth and its resources - manmade and natural. If we look at the geography of the world, more than 2/3rds is in the process of development. Naturally, these developing regions offer growth markets. The amount of investments required for developing geospatial information and infrastructure in the developing countries of Africa, Latin America and Asia is huge and these economies should take the second mover advantage and invest in the latest technologies to create up-to-date geospatial information infrastructure and build their development plans based on this.

A majority of the industry leaders we spoke to agree that the biggest market opportunity at the moment in terms of geography lies in Asia, which includes China and India. These countries are followed by Latin America and Africa. Acknowledging this, Brad Skelton says, "China and India will continue to be growth markets, despite the worldwide economic downturn. These countries have large, skilled populations and a need for infrastructure improvement. We also see continued growth in South America as the awareness and adoption of geographic information increases."

Concurring with Brad’s view, Mark Reichardt says, "Perhaps the main factor in terms of geographic markets is that developing nations are embracing new information technologies. In Asia, the Mid-East, Central and South America and Africa, there has been huge growth in the use of cell phones, and in these regions the use of the Internet is growing rapidly. Over the next few years, this growth will surely continue as the price of most devices and services go down and as user interface technologies enable easier use and more culturally tailored user interfaces and services."

This does not mean that there are no opportunities in Europe and America, though. They are well-developed markets and still offer tremendous market potential in terms of currency and accuracy of data and its integration into mainstream development activities. Extending this argument, Jeff Akers opines that geospatial industry is poised to grow across the globe. "As new data coverages are available, there is a data market across the globe. As we have new technologies, there is a technology play everywhere and the existing technology needs to be upgraded. As we have application and solution breakthroughs, the global economy is the market. I don’t see any specific sub-market better or worse than any other."

Taking a slightly different stand, Josef Strobl says, "As the instability of uncertain economic times will likely lead to an increase in investment as governments strive to gain a better understanding of rivals and a better handle on internal factions. Though energy markets are complex and hard to forecast, Mark Reichardt feels it is likely that once the economic recovery packages begin to stimulate energy-intensive activities such as cement production, steel production and operation of heavy earth-moving machinery, demand for petroleum will rise, and energy will become more expensive. Simultaneously, climate negotiations will lead to carbon restrictions, and this will make energy even more expensive. Competition for oil and increased nuclear industry activity will have serious security implications, which involves geospatial technology. So, during the complex transition away from fossil fuels over the next several decades, businesses and governments will have plenty of need for geospatial technologies."

The market corrections were long overdue and inevitable. Year after year, growth projections increased in an unsustainable manner.
geospatial industry is part of the 'knowledge society' and therefore does not react quickly to regional economic effects, markets grow where development and construction is under way, and where societal factors like environmental concerns take center stage, or where internal or external security plays a dominant role. These markets are not necessarily satisfied by local factors, though.” According to Matt Ball, Brazil, Russia, India and China—the so-called BRIC countries—have emerged as a driving economic force due to fast development. It’s likely that these countries will continue to invest and grow at a rapid pace, because collectively they represent 25 percent of the world’s land, and forty percent of the world’s population.

Going by these opinions, it is evident that different geographies offer different kinds of opportunities. For example, Asia, Latin America and Africa offer more opportunities for large-scale mapping and Europe and America offer opportunities on regular updating and its integration with development activities (applications).

In this revolutionary phase of change in geospatial awareness, India finds a special position of leadership in terms of markets and capabilities, according to KCM Kumar. The billion strong market for location-based equipment is a powerful magnet towards which all geospatial companies in the world are attracted. The economic steps India has taken are on par with world leaders in terms of infrastructure investment and the current scenario has compelled India to also look at substantial investment in the areas of crisis management at the national level.

The modifications made by government in its mapping policy by opening its skies to private industry will stand in good stead. Intelligent maps created will find application using proven software to provide solutions to Indian consumers and governing bodies.

This fast-growing market not only calls for companies with proven track record but also demands understanding of the Indian psyche and the need for hand-holding of the customer even after the sale is made. It will therefore be interesting for many of the international giants to set up partnership or association with Indian companies who already have established base in providing services in geospatial business here, KCM Kumar says.

All the Third World countries started realising the need and utility of spatial data warehousing and are making significant efforts to create respective infrastructure on war-footing.
Potential growth verticals

Though different industry specialists predict growth in diverse range of verticals, they announce in coherence that geospatial technology is poised for growth, the economic downturn notwithstanding. Traditional markets like infrastructure, governance, analysts predict, will continue to grow and strengthen themselves as the importance of geospatial content and technologies increases by the day. Concurring with this prediction, Brad Skelton says, “While defence will continue to be the largest single market for geospatial technologies, there will also be growth in the infrastructure development area. Additionally, there will be a growing use of geospatial technologies in the areas of security, monitoring shipping and other activities associated with the world’s ports.”

Agreeing to the opinion that the major utility and applicability will remain in the areas of services and infrastructure, Prithvish Nag, Director, NATMO, feels this includes soft infrastructure as well. “Demand for information, legislature for public access and right to information has compelled to act in this sector.”

Geospatial technology and information will become part and parcel of consumer behaviour and the markets associated with consumers and will be primarily driven by location-enabled services. In the long term, LBS will mature into a huge market. Giving wings to this optimism, Jeff Akers says, “There is a growing consumer play - many more consumers are looking at satellite imagery to plan a vacation, or are using online maps to plan a business or pleasure route. In reciprocal response, there is a growing spatial play to manage consumers whereby retailers are using demographics, locations and access as they plan their marketing.

There is a play in nearly every industrial market - where are the supplies, where are the demands, and how do we optimise them. The traditional natural resource conservation and management market has matured and is not growing, according to Rajesh Mathur. A growing percentage of the world’s population lives in cities.

The move to create more efficient cities points to a great many opportunities for geospatial application, including the development of digital city models, according to Matt Ball. Geospatial tools will find and can make relevant contribution to bigger challenges of the world order - climate change, environment, global warming and the programmes and initiatives identified under Millennium Development Goals.
(MDGs) while contributing equally to rural development and land management.

As we gain a better handle on the impacts that humans have on the environment, the need for more holistic ecosystem management will feed advancements in geospatial tools. The sensor web, coupled with connected and distributed systems (systems of systems) will greatly improve our powers of earth observation. With the impact of global climate change more closely tied to economic and societal ills, we’ll need to increase our understanding of these linkages and geospatial technology is uniquely capable to provide that feedback, infers Matt Ball.

Another technology growth area that will impact our industry is the increasing use of ‘cloud computing’, an emerging architecture by which data and applications reside in cyberspace rather than on company servers or desktop hard drives.

The major overall trend pulling in other market sectors is the growing availability of geospatial capabilities in information systems of all kinds, proclaims Mark Reichardt. Largely due to vendor implementation and market uptake of standards, now consumers, businesses and governments have much more access to geospatial data and applications than they did previously. This represents a diffusion of all the geospatial technologies, since an earth browser, for example, typically depends on value chains that involve earth imaging data, vector data, location services and photogrammetry.

The new business world of diffused geospatial resources involves a wide variety of products, contract services (including out-sourcing contractors), Web services and consulting. Giving a parallel account, BVR Mohan Reddy says, "There is also a growth market in the consolidation of multiple GIS systems as organisations merge and combine which means migration and integration opportunities (although the economic slowdown may impact this).

One industry worth special note is the Architecture, Engineering, Construction, Owner, Operator (AECOO) industry. There is a huge unmet need for all the stakeholders of a building or capital project (such as an airport) to have access to comprehensive information about the facility over the lifetime of the facility, as might be appropriate given the role of the stakeholder. Geospatial information makes up part of the facility’s "Building Information Model", or BIM, the information that should be online and accessible to anyone who has a need and permission to access the data.

Talking specifically about India, the fastest growing markets are the power and land records verticals, according to BVR Mohan Reddy. Government of India has announced huge funding for modernisation of land records and power distribution reforms aimed at energy audit and reduction of AT&C losses. Urban planning and management and telecommunications are the next fast growing areas. Rural development is potentially a huge market, but it is dormant at this time, for want of appropriate implementation models. concludes Reddy.
Being a fledgling, geospatial industry is in the eye of several challenges, its lack of maturity being the primary one. Geospatial industry needs to take a mature approach in cultivating and improving its presence in the global market. It needs to come together, organise and work towards raising the profile of the industry worldwide. It needs to have its own set of industry associations at national, regional and global levels which could represent the geospatial industry as a whole and address the common concerns and issues of this industry in the world. This kind of framework should work towards promoting and expanding the business opportunities for geospatial industry worldwide.

Many professionals in the industry advocate associating with IT related bodies to help the nascent industry to tie up and work with other agencies. It might not always serve the purpose. Alternately, bringing in maturity within the industry by developing certain standards and certain common minimum agreements is important for the industry.

**Dearth of skilled manpower**

The most important challenge for the industry today is the shortage of skilled manpower. This shortage is felt across the globe irrespective of geographies. Even in Europe, Christian Heipke says, there is dearth of highly qualified young professionals to fill the different positions in industry and academia. Also, the number of engineering students is still too low (this is particularly true for Germany). To counteract this, Heipke says, "We are addressing the needs of young people (for ex., by putting in more basic math courses as this subject is increasingly neglected in high schools), by continuously revising our curricula (for ex., by putting more emphasis on environmental issues) and using marketing tools. But we have had limited success till today."

Extending this argument, Maj Gen Siva Kumar feels that there is not enough geospatial literacy amongst planners, users, academia and the industry as well. Identifying another problem area within this, Prithvish Nag says, projects can be transferred to different locations due to the available ICT backbone, but availability of manpower and technology always play the limiting factors. So far, India has been a popular destination for such outsourced projects. But this might take a dent with the slowing down of the economy.

The other major source of geospatial projects in India is the government and its numerous wings. But there is no continuity in the flow of projects, Prithvish Nag opines. The industry is therefore shy of making large investments. In several cases, geospatial activity is not the main function of an industry. The risk is shared by taking it along with other sectors like involving in ICT, selling of hardware and software and even running training courses.

At the core of every geospatial project in India, there is a considerable component of field survey and field data collection, requiring large land armies with adequate training to be deployed in the field for extended periods of time. However, in view of the fact that, hitherto, most of the land surveys and field data collection were carried out by the government staff in India, such skills have not percolated to the private industry. While the private sector has created a fairly decent force of field surveyors with adequate experience in operating various survey instruments, the relevance of field-collected data and the required methods of collection, associated with cadastral surveys, corridor surveys, urban and utility mapping an natural resources surveys, has yet to dawn upon
the private sector in a broad-based manner, according to BVR Mohan Reddy. With very large scale urban and utility infrastructure development, cadastral surveys, irrigation projects etc. underway in the country, there is a serious dearth of trained survey professionals in the country, which is affecting the quality and, hence the utility, of field-collected data.

The urgent need of the hour is to invest into building capacities and churning out professionals who can contribute to the ongoing process of knowledge building in the field of geospatial industry and be a competent workforce to develop solutions for the upcoming markets. There is definitely a dearth of adequate number of research and education institutions which can provide and serve skilled manpower on regular basis. Reddy makes it clear that this problem can only be tackled by taking up capacity building as a joint mandate between the government and the industry.

**Technology challenges**

Talking about technology challenges, Matt Ball puts integration of 3D views seamlessly among CAD, GIS and BIM as the most significant technical challenge. Both CAD and GIS serve important roles and, while the boundaries have blurred with CAD-based software offering GIS features and vice versa, it is critical to incorporate the strengths of each into a single solution that also includes maturing technologies for visualisation, social networking and more, according to Lisa Campbell. We continue to see geospatial technology mainstream into traditional IT; consequently it is seen less often as a specialised tool and more often as a piece of an organisation’s overall IT solution. For example, this is witnessed when traditional CAD customers demand more integration of their design information with larger corporate knowledge base. The geospatial industry must embrace the IT universe more fully and assert itself, not as the central, organising principle for an organisation’s data and applications, but as a critical component to a complete IT solution.

Thanks to OGC, much is being done to establish industry standards and improve interoperability. But there needs to be much more research and research coordination in the area of interoperability, Mark Reichardt opines, particularly as

> Geospatial industry needs to take a mature approach in cultivating and improving its presence in the global market. It needs to come together, organise and work towards raising the profile of the industry worldwide.
leading scientists and practitioners recognise that the 'big picture' goal is a 'system of systems' approach, as exemplified in GEOSS, the international effort to develop a Global Earth Observation System of Systems.

Another biggest challenge before the industry is the availability of geospatial data. The restrictive practices of some organisations and governments in terms of making their geospatial information publicly available has been a great concern, feels Ed Parsons. The industry lacks well-defined and rational policies with regard to creation, management and accessibility of geospatial data (mapping policies) even in the most advanced countries. The need of the hour is to have an updated, relevant approach in terms of policy framework for this industry.

There's a growing global movement for 'open access' to scientific data and that movement intersects with the growing recognition of the need for an academic focus on interoperability, Mark Reichardt analyses. Also, open access to geospatial research data will result in a sharp rise in the number of people who need to be trained in the use and development of geospatial data and technologies, including scientific models that incorporate these. According to Mark, this need for more research and education represents an important challenge to our industry.

There are significant challenges in the interoperability of model-based designs, including the designer's insistence that models are intellectual property, Matt Ball says. Concurring with his idea, BVR Mohan Reddy says, copyright and intellectual property right issues will be important as in any other area of IT. Another challenge that presents itself is the widespread access and exposure to free geospatial tools. While these tools are increasing the size of the marketplace, the fact that they're free has served to erode some of the value of the market. Integration of disparate geospatial data is a major challenge and also an opportunity, according to BVR Mohan Reddy. The value of geospatial data is greatly enhanced by the integration of complementary data. But putting data from different sources into the same database, map or display screen often requires extensive manipulation. He suggests the promotion of international standards for metadata and open transfer formats to make data integration more seamless to the benefit of all.

**Challenges specific to India**

While the economic growth and world scenario seems to be encouraging for geospatial business in India, the Indian geospatial industry still faces some challenges in terms of ownership of data and responsible processing of data, according to KCM Kumar. These issues can be addressed by policy makers by introducing a code of conduct in terms of the way data should be acquired, processed and warehoused, the agencies which should be allowed to do so, private as well as public, security and safety measures and controls to be installed in the respective agencies to ensure that such licensed agencies can continue their work unhindered expeditiously. The time is not far when these issues would be addressed effectively to meet the challenges of the industry.

On the services side, one of the major challenges for the
geospatial industry in India is the wide gap that exists between the expectations of the customers and the performance of the industry, as BVR Mohan Reddy puts it. This could be partly due to lack of clarity of specifications by the clients and partly due to lack of domain-specific knowledge on the part of the industry in translating the specifications to acceptable deliverables. The quality-focus of the clients and the cost-focus of the industry need to be blended into one single forward approach that can take care of both the concerns, Reddy opines.

Clear definition sought
Lack of a clear definition with regard to the composition of geospatial industry is seen as another challenge. There are different schools of thought, each presenting this industry with different name. Geomatics, geospatial, geoinformatics are just a few usages. We need to have a clear definition and composition of the industry to give a collective recognition and have a collective strategy to promote the industry.

As always with any element of IT - we need to demonstrate the ‘real value’. Nice technology is a luxury in a growing economy, but when things contract, we need to make a clear case for added value. If geospatial industry can crack this challenge, we no longer have a collision between the technology leaders and the financial leaders. If we can show the ‘value’ that spatial technology brings to the bottom line, if we can prove that better transactions are performed, or better decisions are made, we have an advocate in our business leaders to keep this technology in the boardroom. And there lies the real challenge, infers Jeff Akers.

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What are the major threats to the sustainability of planet earth?

I will put this with a perspective on issues that could be connected to space-related systems. Earth is dynamic, not only because of its intrinsic character of atmosphere, plate tectonic movements, etc. but also due to anthropogenic activities causing several perturbations to the normal behaviour of the planet. Central to this is the question related to the growing world population, which is expected to touch 9 billion by 2050. These two significant developments will affect the way we live and the quality of life for each of us. There are many things related to these two. First is the environmental change, which has profound impacts on food security and water security and increase the occurrence of natural disasters. These threats will ultimately tell upon the sustainability of the planet. In a nutshell, it is increasing population, increasing demand on resources, increasing use of energy, impact of anthropogenic activities which include chemical, physical and biological aspects, that are affecting the terrestrial systems.

Can space technology provide a means to quantify these threats and provide solutions and neutralise them?

I don’t think space technology can directly neutralise these threats. But what we have seen in the last 50 years of space programme in India is the fact that it can certainly provide information on the planet earth, whether it is land, ocean or atmosphere and this information base can be used in decision support, which is critical while dealing with natural calamities or other anthropogenically induced problems. Space systems’ role will continue in the coming years. They will continue looking at the planet critically with respect to its multi-dimensional characteristics, dynamic changes impacting the life and society. Talking about environmental issues, they are related to forest depletion and biore-sources, increasing melting of glaciers and the corresponding reduction in snow line. These result in rise of sea-levels and enduring pressures on the physical resources of land and water systems. Space systems can quantify these changes.

With regard to biodiversity, today, we see loss in biodiversity, which is typically between 40-200 species per day. In the past century, we have lost about 5-20% and by 2050 we will be losing around 15-35% of the remaining species of the earth. Similarly, if you look at carbon dioxide loading, it is expected to be more of 480 parts per million by 2050 in the atmosphere. The corresponding temperatures in the global level can increase from 0.63 degrees in 1950-2007 to 0.79 degrees by 2050. These measurements on biodiversity can be done at landscape level. It has to be coupled with the observations on the ground. In the case of CO2, there are satellite sensors that can measure CO2 concentrations and other greenhouse gases at the global level. Talking about snowline and glaciology, we have measured, for example, with our satellites the glacial retreat in the Himalayas, which has been significant in terms of understanding the way some of the glacier boundaries have retreated. There are distinct and realistic threats that glaciers may disappear in 50-60 years. There will be serious implications on water systems which feed into the Ganges, Brahmaputra and other rivers. The world has been counting on satellite capabilities to monitor such changes. Satellites have mapped the degradation of coral systems, which are rich in biodiversity. This is also true with respect to land use and land cover. India has a unique way of looking at land cover systems, degradation of land cover and classification using the wasteland criteria. These are ultimately very useful as information systems and in providing a decision support to ensure that we have a means of retrieving as much as possible from these degraded lands. These are some of the ways in which space systems can contribute to monitor and make quantified numbers with regard to certain aspects of global change and environmental parameters.

What are the challenges you see in putting space technologies to use in this direction?

In the years to come, technologies will be increasingly sophisticated. Sophistication will not be a major issue but making it applicable to the global system will be one. Most of the problems are not only local but of regional and global nature so you need to have global systems. For this, you need to have multiple sensors and satellites owned by different nations. You need to have certain level of standardisation and formatting. And you need to
evolve policies by which data can be used, exchanged and the information derived from them is easily available. Ultimately, we need an institutional framework and that is where the biggest challenge lies. You need to bring in institutions from across the globe and use them to take preemptive steps.

Q. Does any of the present organisations can serve as above?

In India, one organisation that is using remote sensing data to this effect is National Natural Resources Management System (NNRMS). This is a unique institution as it brings several users in the departments of environment, ocean development, meteorology, surveying and agriculture to a common platform. They discuss issues pertaining to the use of satellite data. It also takes up issues of planning and integration of satellite systems in the conventional systems and thereby increasing the efficacy of the systems dealing with such thematic issues.

There are many applications in which we need to put in the "geospatial concept". We have the concept of NSDI. By this, you draw up multiple data sources located at multiple government agencies and synergise them, model them and ultimately provide a solution to a particular problem. There has to be understanding among different government departments to make this possible. Secondly, we need to have standards in place to achieve integration. Also, it is important to know what data is lying at which place and thus the essentiality of having a metadata. So, the challenges lie at both - institutional as well as policy level and agreements on the ownership of data.

At a global level, there are various forums working on this. There are inter-governmental agencies working on atmospheric related data systems and information systems. There is an intergovernmental panel for ocean related systems and similarly for land apart from the UN agencies. Their approach is to convert the locally and nationally available data into a regional and a global system by bringing in appropriate conventions, treaties and agreements. IPCC on climate change, Ramsar Convention on Wetlands, desertification agreements, are a few examples in this direction. I am sure that in the coming years, with the increase in the number of space systems and the availability of data from several nations, we will be able to deal with the issues of the planet more effectively.

Q. Can space technology itself be part of the solution?

It is, in fact. Information received from advanced space technologies is being fed into decision support systems. For example, inputs for disaster management are in the form of information on various aspects of droughts, floods, tsunami and cyclone, earth quake. Satellite sensors could give information even before the disaster strikes. Catching the movement and progress of things during the disaster by satellites should also be seen as a role. Drought and flood monitoring is another example. Then you have plans on preparedness, mitigation, damage assessment and relief. In all these phases, you can use space systems of remote sensing along with those of communication systems to deal with the disaster in an effective way.

Ultimately, the information is also used in certain cases to pre-empt occurrence. In case of flood, you try to analyse the reasons for the flood studying the topography or whether you can re-configure the topography to reduce the impact. There are many such cases in which space systems are being used for sustaining the planet, yet there are many more aspects where this can be used.

Q. What do you think are the three major space technology applications that can significantly contribute to the sustainability of the planet in the next few years?

Disaster management will get enormous support from space technologies. What is important is to have agreements by different nations to ensure that timely information is available from different satellites to a global community or to a particular community wherever it is needed with a short turnaround time. You need agreements and you need good number of sensors for this.

Second thing is environment. In the context of global warming and its multifarious manifestations - the sea level rise, increase in temperature, skewed distribution of rainfall and its impact on agriculture - many of the parameters related to these aspects can be monitored using space systems. So environmental monitoring through a suite of sensors is another important area which certainly needs strengthening.

Third area is water. Today, around 1.2 billion people across the world do not have access to drinking water and most of the glaciers and Arctic ice are shrinking. About 26% of the global wetland has already been lost. Water will be a major issue in the years to come, especially in the event of population pressure. What is needed is the monitoring of water - surface as well as sub-surface, optimise the use of water and a good management system based on space technology.

About 170 satellites with earth observing capabilities are envisaged over the next 15 years and they will carry about 340 instruments on board. This is not a small number and could have a major impact on the way we look at the planet and create a blueprint that will lead us to take scientifically correct and logical decisions to minimise the threat to life.
SuperGIS Mobile Engine is a set of Software Development Kit (SDK) developed under .NET Compact Framework architecture. It can be used to rapidly create the various Mobile GIS applications installed to .NET CF supportive mobile devices.

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The main drivers of environmental change and loss of biodiversity can be attributed to human impacts - habitat clearing and degradation, pollution, fragmentation, hunting, exploitation and land conversion, to name a few (Mace et al., 1998).

The effect of this human footprint is drastic, and highly correlated with proximity to human settlements and access, notably via roads and other infrastructure which allow humans to interact with natural areas and degrade them (Forman, 2000; Riitters and Wickham, 2003; Kareiva et al., 2007; Sanderson et al., 2002). GIS is the perfect tool to map and assess the potential human impacts on ecosystems worldwide in order to generate proxies for threat to landscapes and the relative cost for conservation. The World Wildlife Fund (WWF) works closely with communities who are dependent on fragile, threatened natural resources, therefore identifying the potential overlap of human activities and the natural environment is a crucial step in that effort, essentially, the path to a sustainable earth.

Mapping human access or anthropogenic threat is an important assessment to determine future targets for conservation investments in terms of their vulnerability and persistence, as well as initial cost for conservation (e.g. restoration: a degraded environment is more costly to keep intact or restore). In addition, human access and influence is important to monitor over time to flag new development or settlement expansion that could threaten ecosystems, increase the spread of disease as well as decrease ecosystem services (O’ Sullivan et al., 2008; Foley et al., 2007; Wolfe et al., 2005; Sullivan et al., 2008).

The World Wildlife Fund’s Coastal East Africa priority place (Figure 1) extends over 4,600 km from Southern Somalia to South Africa. This diverse region includes coastal forests, the Eastern Arc Mountains and Miombo woodlands, and habitats for the largest number of globally important threatened and endemic species in Africa, while also being home to some of the poorest human communities in the world. People in this region live on the edge of survival, facing daily hardships, wars and natural disasters, all while relying mainly on natural resources for food, health, shelter and livelihood. WWF has projects throughout the region, including the Ruvuma Wilderness Area, where elephants and other species migrate throughout the seasons following sources of water, resulting in human-elephant conflict. WWF is assessing corridor areas to mitigate this conflict. Further south, the Primeiras and Segundas Archipelago Reserve has been proposed to protect community fishing zones and enhance the local economies.

A snapshot of potential human threat and access was calculated for the coastal east African landscape, similar to...
Mapping human access or anthropogenic threat is important to determine future targets for conservation investments.
the land cover (dense forest is more difficult to cross than open fields), the type of road (paved or a path), or whether the cell is a railroad or navigable river. The friction and town locations were inputs for the cost distance function in ArcGIS, which estimates the effective cost it would require to travel from any source (city, town) to any point in the landscape. The inverse of this layer is the human threat: it defines areas that are more likely remote and intact (higher cost to access), as well as those that are more accessible and more degraded (low cost).

Since population density also plays a role in the magnitude of threat in a region, a human density surface was created using the best available population data (CIESIN settlement points) using kernel density. The two components, population density and the cost layer were rescaled to 0-1 and added together for a total combined human threat (Figure 3). The value is unitless, with a relative value between 0 and 2.

"Population density plays an important role in the magnitude of threat in a region"

This type of data is commonly used to design corridors, protected areas, community reserves and for other conservation land planning in the region, where remote, presumably more intact areas would be of lower cost for conservation and more feasible to adequately protect.

It has often been the case that protected areas are located in regions with relatively little access - there is less potential conflict and land is easier to acquire. Whether this remains true however, depends on whether parks are adequately preventing new infrastructure within strictly protected areas or buffer zones.

In coastal east Africa, a combination of these factors is the case. According to the map, most of the parks tend to be located in large areas of low threat (green), while some newer protected areas like the terrestrial buffer zone around the Primeiras and Segundas Archipelago Reserve already have existing infrastructure and populated settlements.

This is precisely why updating this analysis with new land cover, planned or implemented infrastructure projects will identify the path of human threat over time. In addition, WWF and partners can advocate for better environmental planning for new projects that steer clear of endangered species habitat, corridors or other important ecosystems.

This map is simply the first step in long term monitoring and conservation planning in the region, using a standard methodology that can be reproduced elsewhere.
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Why IYPE and what are the initiatives taken by IYPE to reduce the risks caused by natural and human-induced hazards?

To commemorate the 50th anniversary of the International Geophysical Year (IGY), a series of activities related to the Planet Earth have been envisaged during the triennium 2007-2009, namely, International Year of Planet Earth (IYPE, 2007-2009), International Polar Year (IPY, 2007-2008), Electronic Geophysical Year (EGY, 2007-2008) and International Heliophysical Year (IHY, 2007). IYPE is a worldwide programme supported by more than hundred countries, and has also been endorsed by the United Nations (UNO). It is an ambitious initiative to utilise knowledge acquired by earth scientists across the globe to build safer, healthier and wealthier societies for our future generations. IYPE has ten planned themes. One of them is 'Hazards - minimising risk, maximising awareness'. A number of programmes, specially outreach, are taken up to educate school children, teachers and citizens about natural hazards.

How successful has IYPE been in bringing various stakeholders like governments, industry and scientific community onto one platform? How does it work together with these sectors?

It has been very successful. It has provided a platform for interaction amongst different science organisations, departments, NGOs in India for science and outreach activities. It may also be happening in other countries.

In India, IYPE started with a mega event 'Indian Science Congress 2007' on the focal theme 'Planet Earth', in which more than 5000 delegates participated from all over India and across disciplines. This Congress is unique in the sense that Hon. President and Prime Minister of India addressed the scientists and it is attended by many politicians and policy makers. Both the President and Prime Minister of India emphasised the significance of earth system sciences and its relevance to the mankind.

What is the role of earth scientists in building a sustainable world?

We are facing a few major global problems: Crunch in energy resources, drinking water problem and more serious is the assessment of impact caused due to manmade changes on the planet earth and its environment. Here is the role of earth scientists to deliver in building a sustainable world. Unfortunately, we have not given due importance to earth science studies, even after realising the fact that our existence is due to the earth and its environment.

Talk of earth sciences and we can't stop talking about geospatial technologies. How do you think together, they can be used to achieve sustainability of the planet?

In the recent years, geospatial techniques have contributed enormously in mapping and management of earth resources. Therefore, geospatial techniques play a vital role in the earth science studies and appropriate interpretations.

What are IYPE’s plans to do to achieve its objective to build safer, healthier and wealthier societies? After two years of operationalisation, what are the successes IYPE could achieve and what are the challenges ahead?

One of the principal objectives of IYPE is to bring awareness about planet earth to common man and policy makers, which has been largely achieved through its outreach programme. Several countries across the world, including India, have special IYPE events. Its success story reaches up to primary schools, a backbone to the future societies.

Challenges are manifold. On one hand, it has to promote active science plan for preservation and appropriate use of meagre resources and on other hand, bring that science to society. It is easy in the developed countries but a major task for countries like India.

Can you enumerate on the activities of the Indian chapter of IYPE? How is the response from the stakeholders?

India has been very active right from inception of IYPE. A national coordination committee was constituted in late 2006 to ensure appropriate participation by India in the international endeavours at an early stage (http://iypeinsa.org). This committee has helped in evolving the plan and approach to initiate and strengthen the science and outreach programme of International Years. In addition to the national initiatives, several NGOs, scientific societies and government organisations are actively participating in popularising the science and outreach objectives of International Years. Easily understandable publicity material on earthquake, tsunami and storm surges has been generated in vernacular languages to be distributed to the general public. The Indian Chapter of IYPE has organised an all India student contest as a part of the international student contest. The response has been quite good. India and China were the only countries that sent five students to GLE.
Increase in resolution
Decrease in price

Gandhinagar viewed by Cartosat-2

NRSC Data Centre
National Remote Sensing Centre
Indian Space Research Organisation
Balanagar, Hyderabad - 500 625
Phone: +91 40 2388 4422, 4423, 4425
Fax: +91 40 2387 8158, 8664
Email: sales@nrsc.gov.in
Website: http://www.nrsc.gov.in
The responsible management of natural resources is the key to attaining sustainable agricultural and rural development.

Availability of reliable and timely geospatial information on environmental conditions and their changes is one of the prerequisites of sustainable development, management of land and water resources and protection of the environment. Land use policy-makers and rural development planners need such information to ensure food security for increasing population, supply of fresh water, creation of work opportunities in rural areas and conservation of land and water resources.

These tasks are particularly challenging in developing countries in the arid and semi-arid climatic zones because of the increasing impact of climate change damaging land and water ecosystems and reducing their production potential. Yet, the achievement of the Millennium Development Goals (MDGs), in particular the reduction of poverty and hunger, improvement of health conditions among population of developing countries and attainment of environmental sustainability depends on timely execution of these tasks.

Food and Agriculture Organization of the United Nations (FAO), as part of its mandate, is conducting global assessment and monitoring of agricultural land, forest and fisheries resources, and assisting developing countries with their sustainable development and management. In order to fulfill these tasks, FAO has been involved in provision of geospatial data, information and services to its field projects and headquarters programmes since its establishment. Appropriate geo-referenced information on physical and socio-economic resources for agriculture in the broadest sense, including forestry and fisheries is of substantial value in the analysis of economic feasibility and environmental acceptability of agricultural, rural development and food security programmes.

Over the last few years, FAO has established geo-referenced databases on land cover, global land and water resources, on worldwide forest resources and has created a global fisheries information system and initiated work on global inventories of livestock production systems and the mapping of farming/livelihood systems. FAO maintains numerous statistical databases for the food and agriculture sector that are built up from data provided by national statistical services; a number of these are now being geo-referenced for use in spatial analysis.

In 1992, the United Nations Conference on Environment
and Development (UNCED) adopted the Agenda 21, an action plan for sustainable development. It charted a new approach based on the premise that economic growth has to be supported by strategies for global conservation of land and water resources and environmental protection to be sustainable. To reach this goal, it recommended employment of new geospatial technologies, satellite remote sensing, GIS and GPS for comprehensive assessment of environmental conditions and monitoring their dynamics worldwide.

The Environment, Climate Change and Bioenergy Division of the Natural Resources Management and Environment Department at FAO have particular attention focused upon the role of rural institutions in addressing local development issues. The division provides assistance to its member countries both in the mitigation of climate change and in the development of adaptive capacities of agriculture, fisheries and forestry to the effects of climate change, contributing to sustainable agriculture management. This assistance is provided through a variety of approaches, including technical support, policy tools, institutional strengthening, guidelines and best practices. FAO has established the Environmental Assessment and Management Unit (NRCE) that provides efficient and effective platform for generation of timely and reliable geospatial information at global, regional and country levels to support the implementation of the UN MDGs, UNCED Agenda 21, WSSD Plan of Implementation, international environmental conventions, and its programmes, projects and other activities. NRCE provides training and advisory services on the effective application of advanced geospatial technologies. It includes organisation of workshops for decision-makers, training courses for technical staff in developing countries and implementation of pilot projects. Its operational mode is based on a holistic approach, integrating geospatial data with socio-economic and climatic data, their joint analysis and modeling. Its activities are structured into five major programme elements, focused to provide geospatial support for the following initiatives:

- Preparedness for and adaptation to impacts of climate change;
- Food security forecasting;
- Mitigation of natural disasters;
- Protection of environmental quality and biodiversity;
- Capacity building for the effective application of geospatial data in developing countries;
- Coordination of FAO geospatial activities.

**CASE STUDY**

A case study from one of the FAO’s projects in Burkina Faso below indicates the type of assistance, tools and outputs delivered, and the benefits to the country itself by using advanced geospatial technology to capture, manage, analyse and report on sustainable agriculture development, efficient use of natural resources and assist on drafting national policy using decision support tools and products.

**BACKGROUND**

In Burkina Faso, food security is at the heart of economic and social development priorities. Although the country has been making efforts for many years to stop hunger and malnutrition, food insecurity is still present. Food insecurity is related to numerous environmental and socioeconomic factors like climate, soil fertility, scarcity of water resources, degradation of natural resources, lack of infrastructures, lacking of information management and need for capacity building. Improving information management is considered a fundamental step to reach...
the objectives of the Food Security National Strategy. The strategy has been formulated by the government of Burkina Faso to improve food security and reduce inequalities and poverty in a sustainable way.

Within this framework, the design and implementation of the “Plan d’Action du Système d’Information sur la Sécurité Alimentaire” (PA-SISA) was put into place.

FAO is assisting the government of Burkina Faso in building its capacity to develop and make use of information for action in the field of food security. The programme “EC/FAO Food Security Programme, Phase II” was designed to help the government of Burkina Faso in building its capacity to develop and make use of information for action in the field of food security.

**OBJECTIVES**

The main objectives of the programme are to improve the quality and relevance of the information and analysis, aiming at taking more appropriate, opportune and sustainable measures, and to strengthen national institutional capacity to deliver useful and easy-to-use information on food security and poverty to targeted users.

The following four target areas had been identified for the programme in September 2005 by FAO, with the collaboration of the national partner institutions and the EU delegation in Burkina Faso:

- Technical assistance to the national institutions in view of the adaptation and use of food security and nutrition monitoring instruments, and their integration to the national IMS (Information Management System)
- National institutions’ capacity strengthening in the analysis of food consumption data drawn from field surveys data and statistics
- Assistance in national capacity building for information products delivery in the field of food security, with a high impact on action
- Assistance in the management and use of spatial and non spatial information related to food security in view of the development and constant use of a digital food security dynamic atlas.

The objective of the atlas is to feed the decision making process in the field of food security with reliable and timely information, derived from synergy building between the various isolated systems in the country and exchange of data among themselves.

This information system will be deployed to provide targeted users with spatial and descriptive information and data derived from or collected during the implementation of the project.

**TOOLS AND TECHNOLOGY**

A set of tools and technologies developed or commonly used by FAO is adopted, like Dynamic Atlas for spatial and tabular data integration and display, Microsoft Access and MySQL databases for data archiving, Web technologies for website development and remote database connection and management. These set of tools and technologies make the structure of the Information Management (IM) system, whose architecture was designed to provide an efficient dissemination of geographical information and geospatial analysis on food security subjects.

The Information Management (IM) system is based on three main modules:

- the Dynamic Atlas suite,
- a Geographic Information System, and
- the GeoNetwork OpenSource platform.

The Dynamic Atlas suite, a technology developed by FAO, is made of three different modules, all integrated among themselves and designed to build the atlas and make it available to local stakeholders. Dynamic Atlas is an information management and publishing suite of tools that enable the integration of spatial (map), tabular (spreadsheet) and unstructured GIS DEVELOPMENT
Under the Patronage of His Royal Highness Amir Muhammad ibn Fahd ibn Abd al-Aziz, Governor of the Eastern Province, The High Committee of Geographic Information Systems (GIS) in the Eastern Province will host “The Fourth National GIS Symposium in Saudi Arabia.” Featuring a state-of-the-art exhibit, plenary, keynote, and technical sessions, it would bring all stakeholders in the geospatial domain - academia, researchers, students, and the industry - onto one platform for interaction, sharing and discussion on various topics such as collaboration on technologies and experiences gained. The symposium is intended to encourage the exchange of knowledge and experience in geospatial sciences among researchers, practitioners, and professionals within the country and abroad.

Organizer:
This Symposium is organized by the High Committee of Geographic Information Systems at the Eastern Province in Saudi Arabia.

Background about the Organizer:
The High Committee of Geographic Information Systems at the Eastern Province in Saudi Arabia was formed by the Governor of the Eastern Province on October 20, 2002. The objective of this committee is to coordinate all GIS-related efforts in the region. The committee, chaired by the Deputy Governor of the Eastern Province, Mr. Zareb Saeed Al-Qahtani, includes representatives from the following public and private agencies.

An exhibition for the GIS-related companies and agencies will be held during the symposium. The Organizing Committee of The Fourth National GIS Symposium in Saudi Arabia would like to invite all company to participate in this symposium either as sponsors or Exhibitors.

Floor Plan:
http://www.saudigis.org/exhibition.aspx
Reservation & Payment Procedure:
http://www.saudigis.org/exhibitionmap.aspx
E-mail: exhibition@saudigis.org
Webpage: www.saudigis.org

For more details or Question please call:
Mazen A. Al-Sadat:
Chairman, Sponsors & Exhibition Committee
Mob: (966)-50-461-0331
Ahmad Mahmoud:
Coordinator, Sponsors & Exhibition Committee
Mob: (966)-50-793-4794
Dynamic Atlas is an information management and publishing suite of tools that enable the integration of spatial (map), tabular (spreadsheet) and unstructured (document) data and metadata. The software allows organisation and publication of information in a way that makes it easy for anyone to access and use. The Dynamic Atlas desktop module is very user friendly and allows all stakeholders to access and use the data and information provided.

This module is designed to organise and bring together all the geospatial data into an “atlas-like” built structure with topics, layers, related information data and links to external sources. GIS-derived maps, tabular data and other related documents and imagery from international and national sources are integrated into a “warehouse” using FAO’s Dynamic Atlas technology.

The main components of Dynamic Atlas are:

- Dynamic Maps: is the GIS viewer of atlases.
- Dynamic Knowledge base: provides the ability to quickly and easily set up and manage atlases.
- Dynamic Publisher: enables atlases and Dynamic Maps to be packaged for broad dissemination on CD/DVD.
- Dynamic Web Maps Server: enables publishing of atlases over the Internet.

The Digital Food Security Atlas of Burkina Faso is a digital database of indicators related to food security in Burkina Faso. The atlas can be browsed on the desktop using Dynamic Maps, the GIS viewer of Dynamic Atlas, or through the Web using the online mapping system.

The main topics addressed in the atlas are:

1. Geographic context
2. Food security indicators
   - Food consumption status
   - Health status
   - Nutritional status
   - Demographic conditions
   - Environmental conditions
   - Economic conditions
   - Political conditions
   - Socio-cultural conditions
   - Risks, hazards, shocks
   - Food availability
   - Food access
   - Stability of food supplies & access
   - Household characteristics
   - Health and sanitation
   - Care and feeding practices

The tools for the dissemination of information are provided by the Dynamic Atlas suite for data publishing (desktop based web-mapping system, geospatial data publisher) and by the GeoNetwork platform for metadata catalogue.

The desktop based web-mapping system and the geospatial data publisher are considered the second and the third module of the Dynamic Atlas suite and are the tools needed to make public the atlas generated by the Dynamic Atlas desktop first module.

A commercial GIS, the backbone of the system, is used for processing, analysing and storing food security data and indicators. The GeoNetwork Opensource platform is the key element for data management, metadata editing and data sharing. A key factor for the success of the IM system is its sustainability at local level.

For this reason, two training session have been conducted in Ouagadougou (Burkina Faso), to impart basic skills in the experts to run Dynamic Atlas suite and GeoNetwork metadata catalogue.

MAIN OUTPUTS

The following outputs are expected from the implementation of the project:

- Database of relevant data layers related to natural resources and indicators of food security
- Desktop-based (CD-ROM/DVD-ROM) digital Food Security Atlas of Burkina Faso
- Web-based digital maps and dissemination mechanism for spatially-related data and information
- Strengthened local capacity to manage geospatial information
- Documented procedures, user manuals and
- Harmonised and consistent reporting

Alexander Müller
Assistant Director General
Food & Agriculture Organization of the UN, Italy
alexander.mueller@fao.org
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E-mail: janakii@vsnl.com
Website: www.janakindia.com
Assessing the Spoofing Threat

Seven years after the Volpe Report warned that "false GPS measurements..." civil GPS spoofing could become a tempting target that could be exploited by individuals, groups, or countries hostile to the U.S., civil GPS receivers remain as vulnerable as ever to this threat. Among other types of interference, the Volpe report considers a "[a]s GPS satellites...". It has only one or two, having to sequence through the visible satellites in order to make their measurements.

Helping Farmers Save the Reef

Farmers will be trained to use GPS technology to manage their crops as part of a $23 million rescue package for the Great Barrier Reef, reports The Age of Melbourne, Australia. A 2007 report on water quality linked the reef’s decline to fertilizers, chemicals, and soil being washed from Queensland farms into the ocean. One researcher says the reef will be dead within 30 years unless human activity changes quickly. According to the report, 6.6 million tons of sediment had been discharged into the reef – four times higher than estimated pre-European settlement levels.

Remote Asset Management Worth the Cost

Companies that invest in remote asset-management recouped their investment within the first 12 months of deployment and saw returns well over 100 percent within the first five years of implementation, according to an industry research study. The study, The Impact of Remote Asset Management Technology on the Goods Transportation Industry, will be released this month by communication consultant CSMG, the strategy division of TMNG Global, and sponsored by GPS-enabled remote asset-management provider SkyBitz.

Counting Equivalent Correlators

WITH THIS ISSUE, GPS World and the Innovation column begin their 20th year of publication. The magazine’s first issue in January/February 1990 carried advertisements from a number of GPS receiver manufacturers touting their latest products. Most of these receivers had only a few correlator channels. Some had only one or two, having to sequence through the visible satellites in order to make their measurements.

BIM: Building Information Model

BIM standards are crucial for increasing productivity, more and more important in a world struggling to recover from problems related to real-estate financing. Standards reduce costs in design, construction and management throughout the lifecycle of capital projects such as office buildings, bridges and airports.

Road Extraction for Hazard Management

Fully automatic object extraction has not yet become an operational reality and is still subject to fundamental research (see textbook). However, semiautomatic approaches are becoming increasingly viable in operational settings. Methods that combine multiple views, different sensors, external data or other evidence sources within a sound statistical framework may further enhance the level of automation.

Techno-hyperactivity

To this impressive array we now add a compilation of work by academics, government employees and professionals who are using GIT in an innovative way. Geographic Information Technologies in Urban Hazard/Dissaster Analysis is soon to be published by Springer, but none of the work described is useful if not effectively communicated to decision-makers and the general public. Carefully compiled reports often lie on a shelf gathering dust.

Not going with the Proverbial Flow

Adam Riley describes how an active US non-profit organization is utilizing LiDAR to restore neglected streams and wetlands using an Optech ALTM 3100C.

Successful Franchising with GIS

Where do you locate that next fast food restaurant? Read how a major US franchising business uses GIS as part of a strategic solution incorporating ESRI software to help its quick service restaurant chain grow.

Taking Lidar Data to the Next Level

As our cover image shows, Infoterra Limited is capable of capturing ever higher resolution LiDAR data from both ground and air, where British cities are being re-captured at 8 points per metre.

A New Information ERA - Slip

The Western Australian Government developed a common information framework allowing...
**Community Health Assessment Using Self-organizing Maps and Geographic Information Systems**

From a public health perspective, a healthier community environment correlates with fewer occurrences of chronic or infectious diseases. Our premise is that community health is a nonlinear function of environmental and socioeconomic effects that are not normally distributed among communities.

**A Collaboration Portal for a Humanitarian Emergency**

When Cyclone Nargis hit the Southeast Asian country of Myanmar in May 2008, governments and international relief agencies were faced with a humanitarian emergency that required swift action. Because of the size and complexity of the emergency, the United Nations deployed a Humanitarian Information Center (HIC) website to coordinate relief efforts.

**Crime Mapping Wave**

If you look at the media’s coverage of GIS and online mapping in the past month or two you’ll see a crime wave. No, there’s not necessarily more crime everywhere (though in many areas, it is up); there are just more crime maps online and more discussions about them. Here in the U.S. it seems a great many small towns, counties and large cities have, or will have, some type of online crime map in the coming months. I see at least one article each week in local, city or regional papers highlighting implementations.

**Regression Analysis Tools for GIS Modeling**

ArcGIS 9.3 tools now make it easier to model complex spatial relationships for predicting spatial trends relevant to planning and decision making in society and business.

**American Surveyor (January)**

www.amersurvey.com

**Point to Point: Minimum Level of Competency**

We turn now to a subject that has annoyed me for years, and shortly you shall see why. Discourse is, by its very nature, most useful when the language used moves the conversation in a helpful direction. But we have a term in licensing that (to me) seems calculated to truncate that conversation, smothering debate with a meaningless platitutde. Of course I am referring to the phrase, “minimum level of competency.”

**Finding My Inner Indiana Jones—Using Carlson SurvCE to Survey History**

Every day as I headed to my job, the theme from Indiana Jones kept running through my head. I even had the hat! The site I was surveying was older than any piece of property I had ever worked on before.

**A View into Stadium Innovation from the Top**

The new 63,000-seat-plus Lucas Oil Stadium in downtown Indianapolis will no doubt serve notice to sports fans, sports media and industry around the nation that the Circle City is a serious entertainment and convention business player. The facility is designed for multi-purpose use, thanks largely to a first-of-its-kind retractable roof, the design, surveying and construction of which used extraordinary techniques.

**Enhanced Oil Recovery Revives Petroleum Fields and Reduces Greenhouse Gas Emissions**

Carbon dioxide is not always the villain. It can actually be quite beneficial for companies like Houston-based Anadarko Petroleum Corporation, which is using the greenhouse gas for enhanced oil recovery, a process that involves injecting otherwise tapped out wells with CO2 to produce additional oil. Anadarko uses GIS to track pipeline maintenance, view land reclamation, and keep up with revegetation of native grasses.

**Norway—LNG-Fueled Ferries Reduces Air Pollution**

Some 50,000 islands and thousands of narrow fjords cut into the mountainous countryside along Norway’s jagged coastline. Diesel-fueled ferries have transported people and goods between the islands and across the fjords for decades, but a new fleet of natural gas-powered ferries is now improving mobility without emitting noxious fumes that pollute the marine environment.

**Ten Predictions for 2009**

Energy—The continuing interest in environmental issues is spurring increased growth in investment, political change, and the development of new technologies related to the exploration, research, monitoring and education of energy related technologies. This will become increasingly important to the geospatial community.

**Professional Topography: Recession-proof surveying.**

The popular press is printing a lot of advice about how you can insulate yourself from the recession.

The writers often encourage you to get into a business or a profession that some sage person has determined is immune to the recession. If you already work in or own a surveying business, this advice may not seem very useful. But some of the basic principles can still apply.

**From the Ground Up: LiDAR planning.**

Like all other types of mapping projects, proper planning is critical to the success of a LiDAR project. The decisions made in the planning process have a significant impact on the accuracy and usefulness of the elevation surface.

These decisions must be made carefully given the inverse relationship between accuracy, point density and cost. Decisions that increase accuracy and point density also increase the cost of acquisition and post processing of the data.

**Flood Control from the Air**

The Red River flows northward at a minimal slope as it traverses the relatively flat terrain between North Dakota and Minnesota.

As the snow melts and the rains begin each spring, the rising water challenges the river’s capacity. At least once a year, the Red River overflows its banks. Most of these floods are minor; however, in 1997, an extreme set of conditions conspired to create the region’s most disastrous flood since 1826...

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**February 2009**

18 - 20 February
ESRI Federal User Conference
Walter E. Convention Center, Redlands, USA
[www.esri.com/feduc](http://www.esri.com/feduc)

23 - 25 February
ESRI Petroleum User Group Conference
Houston Marriott Westchase, Houston, TX, USA
[www.esri.com/pug](http://www.esri.com/pug)

23 - 25 February
Trimble Dimensions 2009 - Positioning for Success Today. And Tomorrow
Las Vegas, U.S.A.
[www.trimbleevents.com](http://www.trimbleevents.com)

**March 2009**

3 - 5 March
GisGlobal 2009
Barcelona, Spain
[www.globalgeobcn.com](http://www.globalgeobcn.com)

10 - 13 March
Geoforms 2009
Moscow, Russia

11 - 12 March
PROGIS - International Conference 2009
Villach, Austria
[www.progis.com/events/progis09/index.htm](http://www.progis.com/events/progis09/index.htm)

15 - 18 March
12th Annual IEEE GIS Conference & Exhibition
Hotel Allegro, Chicago, Illinois, USA
[www.AirportGISconference.com](http://www.AirportGISconference.com)

20 - 21 March
iGOMAP 2009
JN Tata Auditorium, IISc, Bangalore
[www.igeomap.org](http://www.igeomap.org)

22 - 27 March
Association of American Geographers 2009 Annual Meeting
The Riviera Hotel, Las Vegas, Nevada

28 March - 1 April
Petro GIS
Bahrain
francesca.krachai@iirme.com

31 March - 1 April
Offshore Survey 09
National Oceanography Centre, Southampton, UK
[www.offshoresurvey.co.uk](http://www.offshoresurvey.co.uk)

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**March 2009**

3 - 5 March
Association of American Geographers 2009 Annual Meeting
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**GIS DEVELOPMENT EVENTS**

26 - 28 April, 2009
Map Middle East
Abu Dhabi National Exhibition Center, Abu Dhabi, UAE.
[www.mapmiddleeast.org](http://www.mapmiddleeast.org)

22 - 23 April, 2009
Map Malaysia
Penang, Malaysia
Providing INCOIS with the speed to race ahead of Tsunamis.

That’s certainty

Indian National Centre for Ocean Information Services (INCOIS) is an autonomous body under the Ministry of Earth Sciences that provides ocean information and advisory services. Post the Indian Ocean Tsunami, INCOIS wanted an information system that could help mitigate oceanic disasters. An accurate early warning system to issue timely alerts was required. Tata Consultancy Services (TCS) developed a GIS based solution consisting of ICT infrastructure for real time data reception, processing, warning generation and dissemination. As one of the world’s fastest growing technology and business solutions providers, TCS leveraged its expertise in Geospatial Technology Solutions to enable real time online monitoring of all data sources. Thereby enabling online alerts. This proved invaluable when INCOIS detected an earthquake off Sumatra within 13 minutes and promptly issued a Tsunami alert to Andaman. Helping INCOIS save human lives by issuing alerts on time. And of course, enabling INCOIS to experience certainty.

To know how TCS’ Geospatial Technology Solutions can help your organization experience certainty, log on to www.tcs.com/eis or email us at corporate.engineering@tcs.com
How Fast is Fast? ERDAS Image Web Server powers through serving even the most demanding applications, when other serving solutions break down. Whether you are serving 1 or 1,000 simultaneous clients, ERDAS Image Web Server continues to deliver in less than one second.

ERDAS Image Web Server sets your GIS free, easily handling the image serving load. Your GIS can then concentrate on delivering smaller, less demanding data sets. Adding ERDAS Image Web Server to your GIS provides easy and fast access to your geospatial data in web, mobile, desktop or server applications.

Ensuring high performance, even on standard and entry level server hardware, ERDAS Image Web Server speeds up your GIS.

See ERDAS Image Web Server in action at iws.erdas.com or visit www.erdas.com for more information. Please contact us at +91 124 4633000 for performance benchmarks.