



India is witnessing a boom in the growth of infrastructure projects- the Government spend on Infrastructure is expected to be of the order of US\$1.0 Trillion during the next 5 year plan. GIS and specifically Esri technology can play a major role in helping the infrastructure companies plan and manage the projects more efficiently and effectively.

Modern infrastructure projects are very complex, span over multiple years and require very careful planning and execution. Very often this means access to large amounts of data in real time and very effective information management. It is proven that close to 40% of engineering time in major engineering projects are spent on locating and validating information. It is also proven that poor communication between systems wastes up to 30% of the project costs.

Effective data and communication management is, thus very important for not only saving on the direct costs of the projects but also in ensuring timely completion and avoiding associated penalties and levies. The engineering information systems benefit a lot by using GIS, and today, many major global projects leverage GIS over the whole chain- planning, survey, construction, operations and maintenance. The studies also show that the ROI in terms of savings on project costs can be up to 7 to 10%, which is substantial, considering the scale and the total investments involved.

In India, the use of GIS for turnkey infrastructure projects is gathering momentum, and before long, we will find that most of the mega projects use GIS effectively. Efforts are also on to build adequate capacity in terms of having trained GIS professionals who can handle and manage these large programs.

In my previous communication, I wrote about how Esri technology leverages the technology- from desk top to mobile and cloud. Constantly keeping pace with the advancement in IT Technology has been a hallmark of Esri.

Esri has been on the forefront of making GIS available to everyone at any place. Last year Esri launched Arc GIS on line- this online technology delivers an entirely new user experience- the users can create their own maps, do their geo spatial analysis and more importantly share and publish what they have created. The technology is very easy to use and highly intuitive- it is really amazing how Esri has made use of the power of Web to deliver GIS to all the users. I would definitely recommend the readers to visit the web site: www.arcgis.com, and experience the power of this technology

S Sridhar
President & COO

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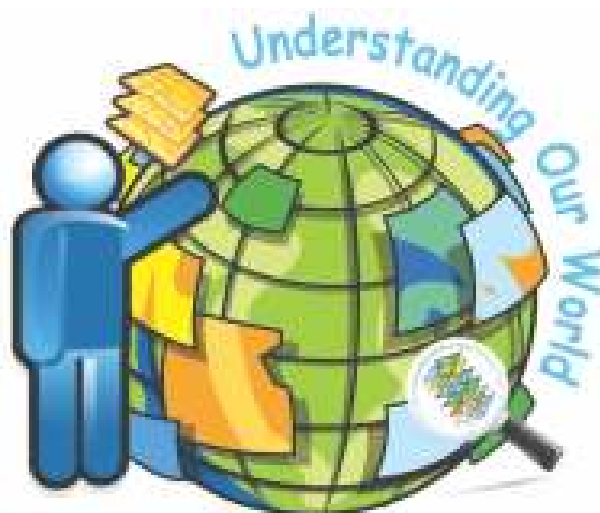


Esri India announces its 12th User Conference 2011

12th Esri India User Conference is the perfect forum for GIS professionals working within the Geospatial arena in the Indian Subcontinent. The User Conference will be held on 7-8 December 2011 at Hotel Radisson MBD, Noida. The theme for this year's UC is "Understanding our World". Every day we face new challenges in our lives, our careers, in society, and in the world. To react to and address these challenges, we need understanding. We need to ask the questions, what exists now? And why? GIS users apply their knowledge and technology to help us in this quest.

The 12th Esri India User Conference is designed and dedicated to the users of Esri technology in India who complement GIS work in their organization and beyond. Open to licensed users of Esri Software, the conference offers presentations, exhibits, meetings covering professional (application) and technical (product) subjects to enable you to learn about the latest in Esri Technology developments and directions. Participating at 12th Esri India User Conference 2011 could give you one-to-one access to senior decision-makers from so many key organizations.

Esri India announces Call for Paper & Posters, inviting its users to submit their abstracts for User & Poster presentation. To



submit your abstracts please visit our website http://esriindia.com/Events/submit_abstract.html or write to papers@esriindia.com or posters@esriindia.com

Esri India participates at 3rd International Geography Congress, Kozhikode

Third International Geography Congress was held from 6 – 8 May 2011 at Kozhikode, organised by Centre for Water Resources Development and Management (CWRDM) in Kozhikode, Sponsored by Kerala State Council for Science,



Technology and Environment, Ministry of Earth Sciences, Department of Revenue and Disaster Management, Govt. of Kerala and co-sponsored by Esri India, DST, ISRO, NDMA, ICSSR, CSIR etc. The focal theme of the three-day International Congress was 'Sustainable Natural Resources Management under Changing Climatic Scenarios.' The event aimed to highlight the various environmental problems associated with development and management scenarios. The congress witnessed around 350 delegates from India and abroad including geographers, hydrologists, academicians, researchers, technologists, engineers, environmentalists, planners, policy makers, and social workers are participating in the Congress. K. Sankaranarayanan, the Governor of Maharashtra inaugurated the Congress. Speaking on the occasion he has said that the age old beautiful relationship between man and Nature is weakening as societies develop and population grows. Time has come to draw deep inspiration from this tradition for a sustainable future-he pointed out. Sankaranarayanan noted that the first major challenge is ensuring food security for the growing population and the second one is energy security.

Esri Receives Strong Positive Rating in Leading Analyst Firm's Utility Industry MarketScope Report

Esri received a Strong Positive rating, the highest possible, from Gartner, Inc., the leading provider of research and analysis on the global information technology industry. The report, MarketScope for Energy and Utility Geographic Information Systems by Randy Rhodes, was published March 22, 2011.

"Utilities around the world rely on Esri technology and Esri partner solutions for crucial business functions including

infrastructure management, emergency response, sustainable development, and risk analysis," said Bill Meehan, Esri's director of utility solutions. "We believe that Gartner's Strong Positive rating affirms our commitment to continue to meet the dynamic and evolving needs of the utility industry."

Esri's ArcGIS technology integrates hardware, software, and data for capturing, managing, analyzing, and displaying all forms of geographically referenced information. Utility industry users are able to query data and identify relationships, patterns, and trends in the form of interactive maps that can be viewed on the web, from the office, and in the field.

Esri Press Revives Johann Lambert's Cartographic Classic

Notes and Comments on the Composition of Terrestrial and Celestial Maps, recently republished by Esri Press, brings to light the work of Johann Heinrich Lambert, a man whose

work constitutes the beginning of the modern period in mathematical cartography.

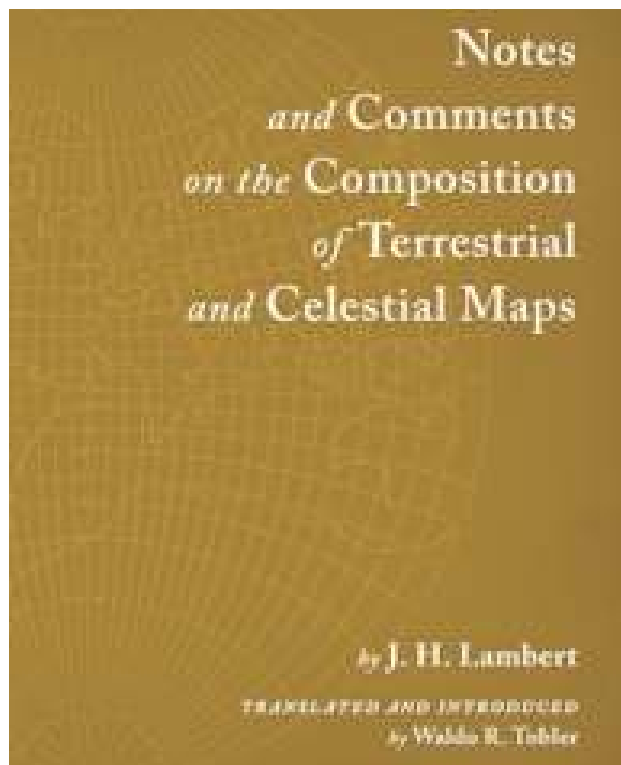
The original German edition, published in 1772, introduced several distinct map projections created by Lambert that are still in use today. Unavailable for several years, the 1972 English translation by noted geographer Waldo R. Tobler has been enhanced to include an expanded preface and updated reference section in its new release.

"The subject of map projections has seen important contributions from many remarkable individuals, with Johann Lambert [being] one of the foremost authorities," says Tobler.

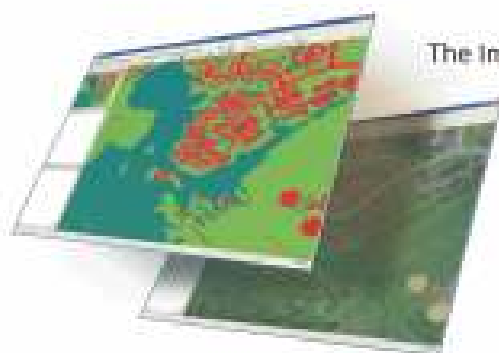
Tobler is a leading geographer and cartographer who has authored and coauthored many influential articles and papers on cartography and map projections. He is professor emeritus in geography at the University of California, Santa Barbara.

Through its Classic Series, Esri Press preserves important scholarship in the field of cartography by republishing seminal texts that are no longer in print. Other books in this series include *Semiology of Graphics* by Jacques Bertin, *The Look of Maps* by Arthur H. Robinson, and *Cartographic Relief Presentation* by Eduard Imhof.

Notes and Comments on the Composition of Terrestrial and Celestial Maps (ISBN: 978-1-58948-281-4, 132 pages, \$24.95) is available at online retailers worldwide, at esri.com/esripress, or by calling 1-800-447-9778. Outside the United States, visit esri.com/esripressorders for complete ordering options, or visit esri.com/distributors to contact your local Esri distributor.



Unlock the Information in
Your Imagery Quickly & Easily



The Image Processing and Analysis software for GIS Users

- Easily add image processing to your GIS
- Proven scientific processing results from easy to use workflows
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Intelligent Web Maps and ArcGIS Online

Maps have always been a fundamental part of understanding our world. They have evolved from simple paper documents to intelligent web maps that today can encapsulate the rich knowledge embedded in GIS systems. These maps are now easily created by anyone and shareable on any device.

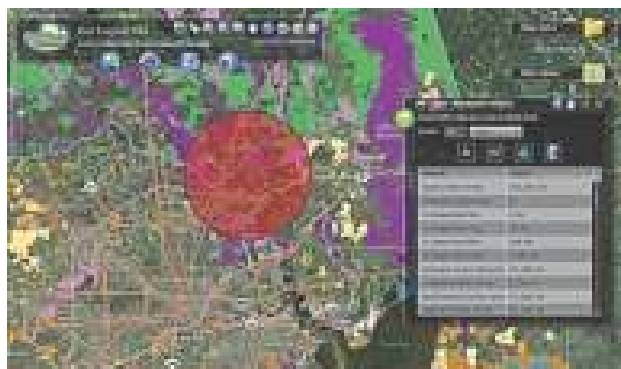


ArcGIS Online is a rapidly advancing cloud-based system for creating and sharing maps and geographic information. It enables anyone to create, view, and use intelligent maps. Users can also upload and style geographic data, create web maps, interact with maps on any device, and embed maps into websites and web-based applications. The system leverages Esri's cloud infrastructure and allows users to store and manage their maps and geographic information, as well as make them readily available to a wider audience through open, scalable web technology.

Opening Up and Sharing GIS Data

Today, GIS data is often unintentionally locked up within GIS organizations and is unavailable for discovery and use by the broader community. There is tremendous value in the authoritative content created and maintained by GIS users around the globe. There are many reasons for this lack of access, including cost of services and lack of server infrastructure, as well as a general lack of knowledge and resources to make this data more generally available. ArcGIS Online is a platform for opening and sharing this information. ArcGIS Online allows users to easily make and share their maps and data in an open and standards-based environment.

Anyone can access this platform to make maps; combine these maps with other layers to form new maps; and share these maps via e-mail or embed them in applications, websites, or blogs. They can be accessed by a variety of easy-to-use, free viewers and open APIs available as REST services. This platform represents an evolutionary step in the dissemination and accessibility of geographic knowledge and is a key building block for making geographic information pervasive and widely accessible to everyone.



The Eco Logical GIS mapping tool is part of a regional decision support system designed to share information across organizations and with communities throughout the Houston-Galveston area.

Anyone Can Use It

ArcGIS Online enables anyone to make rich, interactive, intelligent maps that can be leveraged in many different ways. This includes GIS professionals who may want to make their work more widely available using the web, knowledge workers wanting to visualize and analyze business data, or someone who just wants to create a simple map and share it. ArcGIS Online provides tens of thousands of online authoritative datasets and services created by Esri and the GIS community. Examples include emergency responders who can share event status in a crisis situation, land-use planners who can collaborate on geodesign, and citizen science volunteers who can share observational data (e.g., animal sightings). ArcGIS Online makes this collaboration possible. It also promotes efficiency by allowing users to make a map once and leverage it in many different ways.

Many Ways to Create and Share Compelling Maps

Users can discover maps by searching a catalog with keywords related to a subject of interest, or they can make maps by using one of the ready-to-use viewers. Users can choose to begin with an existing map and add layers to it, or they can start with a fresh map by choosing from a variety of online basemaps and putting their data on top of one of those.

Knowledge workers with no GIS experience (or software) can easily upload their own information and visualize it as maps using symbolized points, lines, and polygons. They can configure interactive pop-up windows and integrate other data, such as reports, photos, documents, and links that add rich context to web maps.

Because ArcGIS Online is in the cloud, once a user has created a map and shared it, the map is automatically part of an online catalog. Users can choose to keep it private, share it with other groups, or share it with everyone. Others can add additional layers to these maps and share them again as new maps. These maps can be used in a variety of ways—through a browser, on a mobile device, in a desktop GIS system, or in a custom application.

A Complete SaaS Application That Is Integrated with Enterprise GIS

This summer, Esri is expanding and transforming ArcGIS Online into a complete Software as a Service (SaaS) application. ArcGIS Online will allow users to create and share their web maps and data in a cloud environment, including the ability to store, manage, and host services. This system allows users to easily publish their content for others to use, off-load selected processing activities, and share their knowledge, thereby extending their own capabilities with low-cost cloud infrastructure. Users will be able to expand their systems using this new flexible and scalable deployment option and increase the value of their GIS by making geographic information more broadly available.

With these new capabilities, anyone will be able to upload their geographic data directly to ArcGIS Online and automatically convert it into a web map. The uploaded

information can be a map created using the ArcGIS Desktop ArcMap application, or it can be simple map or tabular data, such as shapefiles, CSV files, or spreadsheets. Once this information is added, ArcGIS Online automatically creates a web map that can be published as a web service for focused or widespread use. These maps can then be shared or combined with other map layers to author yet more rich web maps.

Open and Standards Based

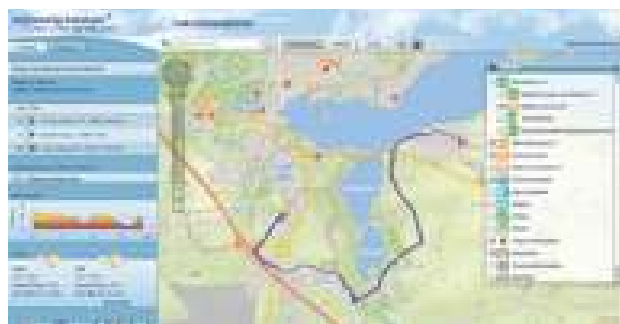
ArcGIS Online is open and supports multiple open standards, including shapefiles; Open Geospatial Consortium, Inc., Web Map Service (WMS); KML; and the native map services from ArcGIS Server. Maps and geoprocessing services can be

accessed using the open REST protocol. Of course, ArcGIS Online also supports ArcGIS Desktop and ArcGIS Server, providing a fully integrated web publishing solution for ArcGIS users.

ArcGIS Online is already a rich content system and contains a global atlas of beautiful basemaps and imagery, as well as nearly 100,000 datasets and map services that have been shared and registered in its catalog by GIS users from around the world. Users can easily access, discover, and use these global geospatial resources to create and share compelling maps and carry out geospatial analysis. This content can also be easily integrated with the growing social media and geospatial content now available on the web.

The Road Ahead for ArcGIS

Cloud Services, Hosted Map Content, and the New Runtime at ArcGIS 10.1



The schleswig-holstein online bike routing portal allows tourists to plan and map their itineraries between 2,500 points of interest, taking into account average speed, terrain, and weather forecasts. See more cloud services articles throughout this special issue.

The primary theme for ArcGIS 10.1, which is expected to be released in early 2012, is sharing and collaboration. Users will find that this release makes it simpler to put mapping and geospatial analytics into the hands of more people without requiring that they be GIS experts. ArcGIS users will be able to deliver any GIS resource, such as maps, imagery, geodatabases, and tools, as a web service. The ability to access these services will be built into ArcGIS, as well as any application built with one of the ArcGIS APIs.

With this release, cloud computing—both public and private clouds—will play an increasingly critical role in how users get their work accomplished. ArcGIS software will take advantage of the powerful, scalable, and ubiquitous nature of cloud infrastructures to store and distribute geospatial content. Users will be able to easily package their maps and layers and make that content available to staff, stakeholders, partners, or the public via online groups while maintaining complete control and ownership of their content. Additionally, users will be able to quickly deploy GIS servers in the cloud when they need them as fully functional production systems for publishing services and supporting desktop, mobile, and web applications.

At 10.1, ArcGIS for Server will run natively on 64-bit operating systems. Users will notice significant performance improvements for activities such as web editing, map caching, spatial analysis, finding addresses, and using imagery.

Imagery will also be better integrated into the core of ArcGIS. ArcGIS will not only make it simpler to use imagery but also support more imagery sources, as well as lidar and radar.



This lightweight application for the City of Newport Beach, California, was built using ArcGIS API for JavaScript. It allows easy access to the city's GIS data.

An exciting addition to ArcGIS at 10.1 will be ArcGIS Runtime, which lets developers create and deploy focused, stand-alone GIS applications for desktop users, who have been asking for a small, lightweight deployment that, in terms of capabilities, fits between ArcGIS Engine and the ArcGIS Web Mapping APIs. The new runtime is designed for both desktop and cloud development. It has a fast display and does not require installation; it can be run directly from a CD. The learning curve for the new runtime is expected to be very gentle for developers familiar with the web APIs.

In addition to these enhancements to ArcGIS, Esri has also concentrated on providing core GIS tools to help users create better maps. These tools range from dynamic legends to contextual generalization, the ability to track edits, parcel editing tools, analysis tools, and a whole lot more.

Finally, as Esri moves toward ArcGIS 10.1, Python is becoming foundational to ArcGIS. It essentially bridges the gap between GIS analysts and programmers.

Learn more about what's coming in ArcGIS 10.1 by visiting esri.com/whatscoming.

GPS Support Fully Integrated in ArcGIS Explorer Desktop

One of the Many New Features Available with Latest Release



The new version of ArcGIS Explorer Desktop supports new capabilities, including complex spatial query of features and full integration of GPS devices to capture current location, along with waypoints and tracks.

The new version of ArcGIS Explorer Desktop (build 1700) incorporates support for GPS. End users can fully integrate with their GPS devices to capture current locations, as well as waypoints and tracks.

This release also supports spatial selection using shapes (points, lines, areas) to query features using spatial operators such as contains, intersects, overlaps, or within. Combined with the existing support for logical queries, this provides a powerful set of capabilities that enables users to derive more value from their data.

ArcGIS Explorer Desktop is a free GIS viewer that gives end users



ArcGIS Explorer Desktop has integrated GPS support, allowing it to be used with GPS devices to capture current location, along with waypoints and tracks.

an easy way to explore, discover, visualize, and share geospatial information and authoritative data with a broad audience.

The new release includes many other geo-capabilities, such as image georeferencing and the ability to add geotagged photos directly to the map at their tagged location or geotag photos manually.

Other enhancements include spatial query against KML and query by attribute of layer packages.

Download ArcGIS Explorer Desktop by visiting esri.com/arcgisexplorer.

ArcPad 10.0.2 Makes Fieldwork More Efficient

ArcGIS Server ArcPad Extension Allows Updates from the Field to the Cloud



ArcPad 10.0.2 simplifies tasks and increases access to geographic information.

The latest release of ArcPad, version 10.0.2, now makes field mapping and data collection easier and data availability immediate. Since the release of ArcPad 8, users have been able to take advantage of the ArcGIS Server ArcPad extension to quickly send edits back to their enterprise geodatabase directly from the field. Edits from ArcPad, as from any feature service, can be enabled on top of ArcGIS Server on Amazon Elastic Compute Cloud (EC2) Amazon Machine Image (AMI), which is preconfigured with SQL Server Express. Optionally, if

more space for editable features is needed, ArcPad edits can be synchronized with the Enterprise Geodatabase AMI, also available with ArcGIS Server on Amazon EC2. Further, with the new licensing for ArcGIS Server in 1-, 3-, and 12-month terms, opportunities emerge, for example, for seasonal field data collection campaigns or unpredictable emergency response operations.

ArcPad includes advanced GIS and GPS capabilities for GIS professionals to capture, edit, and analyze geographic information quickly and efficiently. Critical data can be checked in and out of a multiuser or personal geodatabase and shared throughout an organization. The new release extends customization options and annotation capabilities, streamlines tasks, and increases access to geographic data.

The improved customization capabilities in 10.0.2 let users more easily add, delete, or modify standard ArcPad tools. They can now create a custom ArcPad toolbar or multiple toolbars for various projects and tasks within the ArcPad environment. As in previous versions, users can still extend customization further by using ArcPad Studio to add custom tools that contain scripted actions and behavior. ArcPad

Studio is the development framework to create projects tailored to an organization's specific workflow. It is already included in core ArcPad functionality.

Also new in 10.0.2 is an improved graphics layer and support for annotation targets. ArcGIS map annotation groups are now exported as individual graphics layers. Users can expect better matching of text and geometry symbols between the ArcPad graphics layers and ArcGIS Desktop. They also have the ability to choose to export all annotation groups at once with the Get Data for ArcPad wizard or export one annotation group at a time with the Export Graphics Layer for ArcPad tool.

Other enhancements in ArcPad 10.0.2 include

- **A New Shortcut to Create ArcPad Apps**—Users can create a shortcut to launch ArcPad projects from the desktop or home screen. They can also choose to launch ArcPad with only their custom toolbars, not the standard (default) toolbars.
- **Updated Help System**—The ArcPad help system has been improved with new topics and enhancements to existing menus and features.

For more information about ArcPad, visit esri.com/arcpad.

Portal for ArcGIS—New Software Product for Making Maps, Sharing, and Collaborating in a Secure Environment

Many organizations have asked how they can duplicate the capabilities of the ArcGIS Online website behind their organization's firewall or in a private cloud. The answer is Portal for ArcGIS—a customizable version of the ArcGIS Online website that provides the same collaboration and sharing tools but in an organization's secure on-site or cloud-based environment. Portal for ArcGIS becomes the central repository for an organization's authoritative content that can only be accessed by users inside the organization. It gives them the capability to quickly and easily build maps, share these with the entire organization, and form groups and communities to collaborate on projects and exchange project-based information.



Organizations can customize the look and feel of Portal for ArcGIS.

Users can create maps with the integrated web map viewer or use ArcGIS Explorer Online or ArcGIS Desktop and access shared layers and task services, for example, analytic models, to add to their maps. These maps can then be shared with everyone in the organization or just specific groups. Developers inside the organization can access shared content for use with ArcGIS Web Mapping APIs to create focused web, mobile, or desktop applications. Users can decide whether to share their content with everyone in the organization or just with a specific group that is collaborating on a project or that has formed around a common interest. In addition to sharing their maps, users also have the ability to embed maps on a web page or a blog with just a few clicks.

Searching for items not only is based on tags but also considers frequency of use, amount of details provided, and ratings and comments others have added to a specific item. Maps created and shared by one person can be used by someone else and made into new maps by adding additional layers then sharing them again.

With Portal for ArcGIS, organizations have the option to use their own basemaps and reference layers or license ArcGIS Data Appliance to access global basemaps published by Esri, which include the World Topographic Map, World Street Map, World Imagery, and a number of reference and specialty maps. Web mapping application templates are also included. These templates give users different layout options that can be configured and quickly implemented without any programming. Portal for ArcGIS also integrates with Esri Geoportal Server, a free, open source product that supports common and custom metadata profiles, for example, Federal Geographic Data Committee, International Organization for Standardization, and Dublin Core.

Why should an organization implement Portal for ArcGIS instead of using the publicly available ArcGIS Online website? While the ArcGIS Online website supports private sharing of items through groups, certain business needs dictate that organizations keep their content secure behind their own firewalls. This may include sensitive data for doing confidential research or data with strict privacy controls, such as health care data. The administrative and account management tools provide system administrators with the ability to manage users, groups, and shared items and set user storage limitations. An identity store provides credentials for authentication and security and can be integrated with existing identity stores. Organizations can choose to implement a hybrid version of Portal for ArcGIS that allows access to the Internet for specific content or have the portal completely hosted by Esri as managed services.

Portal for ArcGIS will be available with the ArcGIS 10.1 release. In the meantime, users who would like to discuss their immediate needs can contact the Esri office near them or visit esri.com/portal for more information.

Keep Government Moving

The Geographic Approach™ to Sustainable Fleet Management

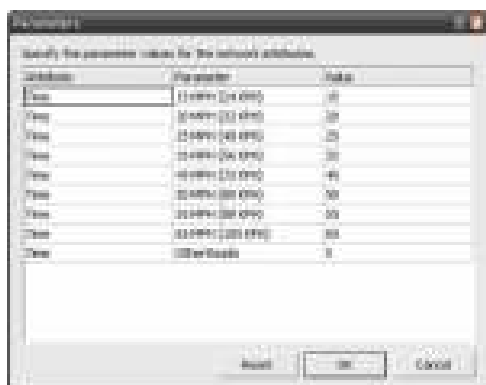
Anyone working within a government agency is likely not a stranger to a geographic information system (GIS). For decades, governments around the world have been using the software to effectively manage and improve their business processes. From asset management to public outreach and regional coordination to enabling organization-wide efficient productivity, GIS software supplies essential geographic information to the entire staff from in-house employees to the mobile workforce.

GIS technology is about improving your business processes and having a real economic impact on the bottom line. It means producing new and more relevant business workflows that significantly increase the efficiency of an existing process without having to re-engineer your processes. A GIS application becomes a tool that clearly benefits the organization.

An often overlooked critical component of logistics is integrating it into the workflow. It is an important aspect of any organization, and within government agencies, the work of logistics managers can have broad-reaching effects on far-flung departments. ESRI's ArcLogistics™ is more than a tool for creating and compiling geographically referenced information. It pushes us to ask questions about the world where we work and explore options for solving our immediate problems.



Import customer orders from any database.





(Has to Come as Box Item)

Green Government Fleets

With ArcLogistics and NAVTEQ® data, you can build routes and schedules that reduce fuel consumption and vehicle emissions that contribute to poor air quality.

ArcLogistics can help you meet customer expectations and improve your business processes with existing staff while realizing savings in fuel costs. By reducing fuel consumption, you can minimize your organization's carbon emissions, help it to become more sustainable, and remain within budget.

ArcLogistics is fleet management software that uses a GIS-based approach to street network spatial relationships to accurately model time and distance. When you implement ArcLogistics, you can lower the carbon footprint for the mobile workforce fleets as the number of miles driven per vehicle is reduced.

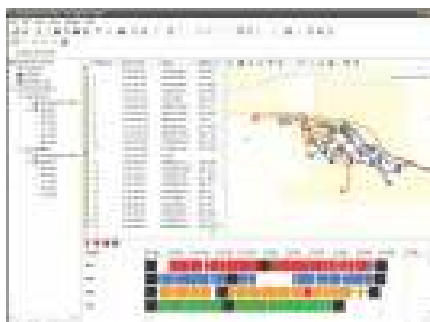
If you need to find locations, assign stops to vehicles, and sequence stops with a regard to time, cost, capacity, and productivity, ArcLogistics can help you meet customer expectations with existing staff and realize savings in fuel costs. By reducing fuel consumption, you will be minimizing your organization's carbon emissions, helping it become more sustainable while still remaining within budget.

A Return on Investment That's within Reach

With ArcLogistics, your mobile workforce will be empowered to take responsibility for conserving resources and limiting fuel costs at the source of trip generation while reducing financial burdens and doing its part to benefit the environment. From a small fleet operation to a large multiuser environment, ArcLogistics provides a quick and significant return on investment.

ArcLogistics is affordable and easy to implement and requires minimal training. Databases do not have to be re-created in ArcLogistics.

- Meet the challenges of limited resources.
- Improve services through efficient routing.
- Promptly respond to work orders, inspection requests, and code enforcement demands.
- Increase the number of stops completed.



Build routes based on actual network drive times and business rules

- Create more efficient inspector territories with balanced workloads.
- Audit mileage and work activity.

ESRI and NAVTEQ—Your Partners for Success

A comprehensive strategy of enhanced data integration is at the forefront of successful implementations. High-quality map data is integral to routing and managing fleets. With ArcLogistics, you can use your own street data or purchase the software with comprehensive street data from NAVTEQ.

Building a GIS program requires people, software, hardware, data, training, and documented workflows. System design often requires cooperation and coordination from various providers to ensure that the components you choose will work together and meet your long-range plans. ESRI has teamed with NAVTEQ for a solution that satisfies your requirements and streamlines the design process.

NAVTEQ's enhanced database, working with ArcLogistics, is the complete solution for your routing needs. NAVTEQ and ESRI have a long-standing relationship, and their products have been field-tested together and verified by satisfied customers.

Comprehensive Street Data for Local Government

The real value of this NAVTEQ offer is that your agency can now have a database of a detailed road network without the expense of creating one in-house. Jurisdictions can use one consistent and accurate street dataset for analysis, mapping, points of interest, and visualization throughout all departments.

NAVTEQ focuses on accuracy, detail, reliability, flexibility, and maintenance to ensure that local agencies will have access to the best data that reflects new subdivisions, expanding businesses, and other alterations to the landscape. Users will find details including road geometry and up to 260 attributes for each section of road. New attributes, features, points of interest, and enhancements are regularly added to the map database.

- The NAVTEQ dataset for ArcLogistics includes street information with navigational attributes that provide turnby- turn directions and enable in-dash vehicle and portable navigation devices, route planning, map display services, and location-based services.
- The dataset is comprehensive including areas outside traditional service areas.
- The dataset includes details regarding ramps, road barriers, sign information, bridge heights, addresses, speed categories, and traffic rules and regulations.
- The dataset supplies a complete dataset for national, statewide, or regional routes.
- NAVTEQ is the authority on routable and navigable street data.

Source : www.esri.com/fleet



Create dispatcher summary reports, route overview maps, street-level directions, and driver manifests as well as send stops to ArcLogistics Navigator for in-vehicle navigation.

Mapping India Census through GIS

Introduction

The Indian Census is the most credible source of information on Demography (Population characteristics), Economic Activity, Literacy & Education, Housing & Household Amenities, Urbanization, Scheduled Castes and Scheduled Tribes, Language, Religion, Migration, Disability and many other socio-cultural and demographic data since 1872. Census is the only source of primary data at village, town and ward level. It provides valuable information for planning and formulation of policies for Central & State Governments and is widely used by National & International agencies, scholars, business people, industrialists, and many more. The delimitation/reservation of Constituencies - Parliamentary/ Assembly is also done on the basis of the demographic data thrown up by the Census.

India is the world's second most populous country. Enumerating around 1.2 billion people is not an easy task. The responsibility of conducting the decennial Census rests with the Office of the Registrar General & Census Commissioner, India under Ministry of Home Affairs, Government of India. The Indian Census is the largest single source of a variety of statistical information on different characteristics of the people of India. With a history of more than 130 years, this reliable, time tested exercise has been bringing out a veritable wealth of statistics every 10 years, beginning from 1872 when the first census was conducted in India non-synchronously in different parts. To scholars and researchers in demography, economics, anthropology, sociology, statistics and many other disciplines, the Indian Census has been a fascinating source of data. The rich diversity of the people of India is truly brought out by the Decennial Census which has become one of the tools to understand and study India.

The Census Act was enacted in 1948 to provide for the scheme of conducting population Census with duties and responsibilities of Census officers. This organization was made responsible for generating data on population statistics including Vital Statistics and Census. Later, this office was also entrusted with the responsibility of implementation of Registration of Births and Deaths Act, 1969 in the country.

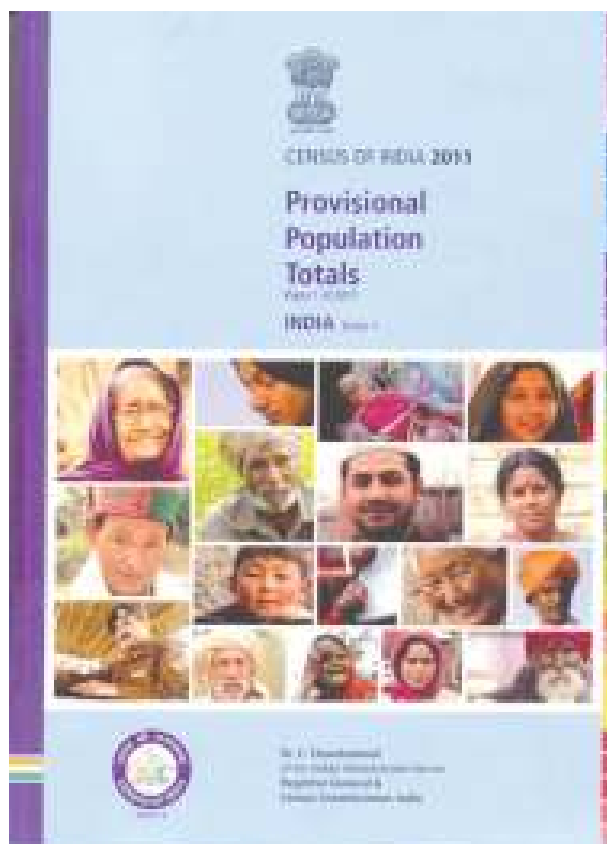
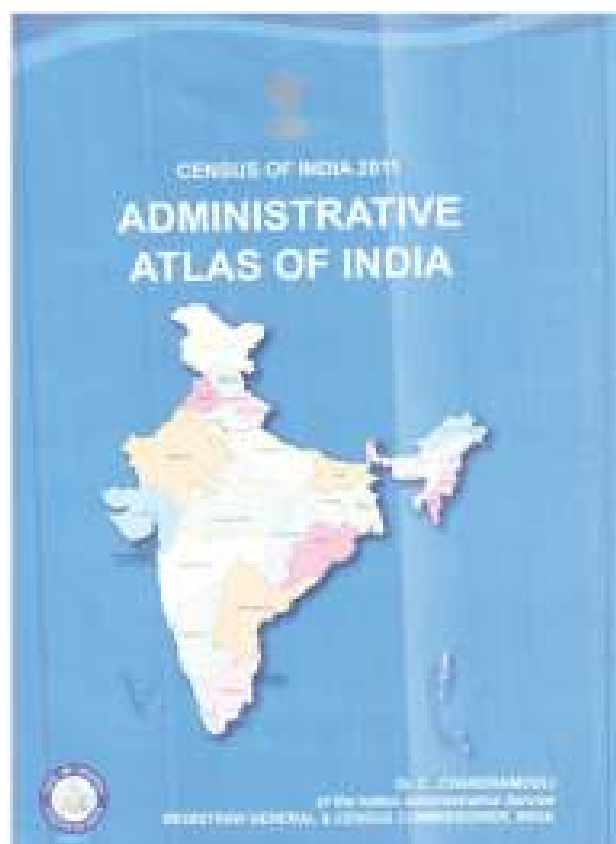
GIS Technology Adoption

The Census Organization of India is one of the largest producers of maps in the country. It has nearly 130 years of experience of disseminating census data and publications of maps. Standards of cartographic excellence can be seen in the geographical maps published in the Census reports of 1872 of North-West Provinces, Cochin, Bengal and the very excellent volume of maps of different collectorates of the Bombay Presidency of the same decade, the five taluk maps of Mysore state published in census report of 1891, maps published in the Encyclopedia, Linguistic Survey of India, the State Census reports of 1931, the Special All India Ethnographic Appendix published in 1933 and the maps included in the District Census Handbooks of 1951 onwards. A major shift in mapping Census data however, was witnessed during Census of India 1961 when the first Census Atlas of 1961 was published in 1968. In addition, the State and Union Territory atlases were also published as a sequel. The tradition continued in the subsequent Censuses also.

Two kinds of maps are prepared by the organization.

Maps for use in Census (pre-Census)

The preparation of administrative maps has been part of Census taking since 1872 when first Census was held in India



non-synchronously. Since 1881, synchronous Census held throughout the country and continued uninterrupted. The Census 2011 will be the fifteenth in the series since beginning and seventh since Independence. The mapping activities also remained integral part of it.

The administrative maps prepared for the census helps in covering all the areas in the country without any omission and overlapping. Therefore, the organization prepares administrative unit maps at all levels i.e. State and Union territories, districts, sub-districts (Tehsil /Taluk/ CD blocks/Police stations etc.), villages, towns, wards and the enumeration Blocks.

Census mapping provides an accurate geographic frame to ensure distinctiveness of units of enumeration. As pre-requisites before Census taking, the jurisdictional boundaries are frozen. Various level of territorial units according to which census is to be conducted are clearly delineated and their maps are secured. The maps help to clearly demarcate the boundaries of the country as well as its division into provincial territories and further sub-division into districts and down to the smallest enumeration areas of villages and towns. The census organization make sure that these maps representing the latest position of the administrative jurisdiction and all changes notified by the State Government in respect of the clubbing of villages or determination of boundaries of municipalities etc., are properly accounted for. With the help of these maps the census officers responsible for enumeration of the territory clearly know the dividing line between his/her jurisdiction. The purpose is to ascertain that the units of enumeration are not overlapping and that they are collectively exhaustive. These maps are used in each phases of census taking, i.e., House listing operation and Population Enumeration.

Maps for use in data dissemination (post-Census)

The post-Census mapping includes dissemination of the census data through thematic maps on various Census themes at State/District/Sub-District or village level allowing proper spatial analysis. These are published in various map

products like Census Atlases and Districts Census Handbooks (DCHB). During each Census, the organization produces more than ten thousand administrative and thematic maps, which are made available for the user agencies, planners, researchers, students and policy makers. Census Atlas, Administrative Atlas, Language Atlas, Historical Atlas of India and of each state and Map profile are some of the prominent decennial publications of the organization.

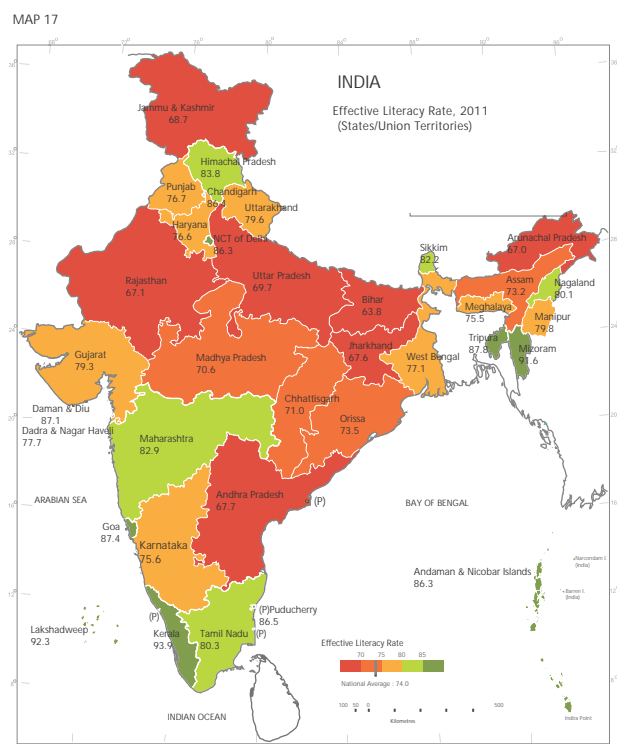
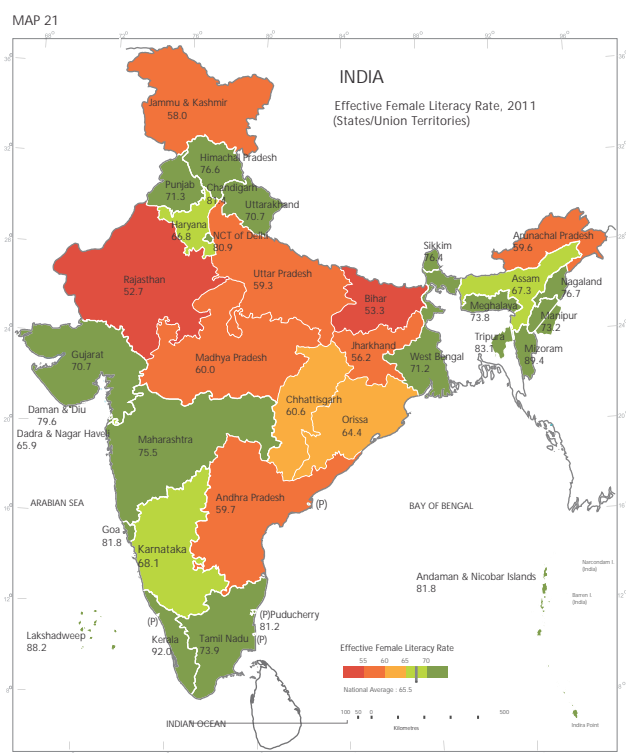
Besides, maps are also published in special reports, monographs and publications like Temples of Tamil Nadu. Regional Division of India at the National and State levels and district maps showing village boundaries is one of the prestigious product of this organization.

Benefits of Internet based Mapping in Census

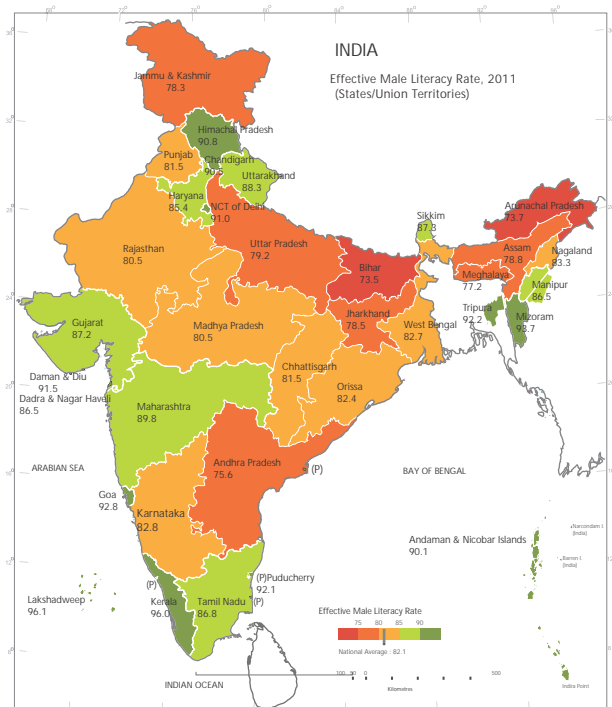
Updating of the GIS tools, which were introduced and adopted since late 1990's in the Census Organization, has speeded up the process and enhanced the quality of the maps. The Census Organization has the capability and the infrastructure for generating theme based maps using GIS but for use on the Internet, it was considered important to look for appropriate technology. In 2001, Census GIS India was a step in this direction, which allowed generating thematic maps based on Census data, on an interactive basis using GIS technology. Software was developed and available at the Census of India Website which allows generation of thematic maps based results. It has become very popular among Government departments, NGOs, Universities, Research Scholars and other data users. This software in a way has demystified GIS and has now become a friendly tool to analyze Census data using GIS technology on the Internet.

Census 2011

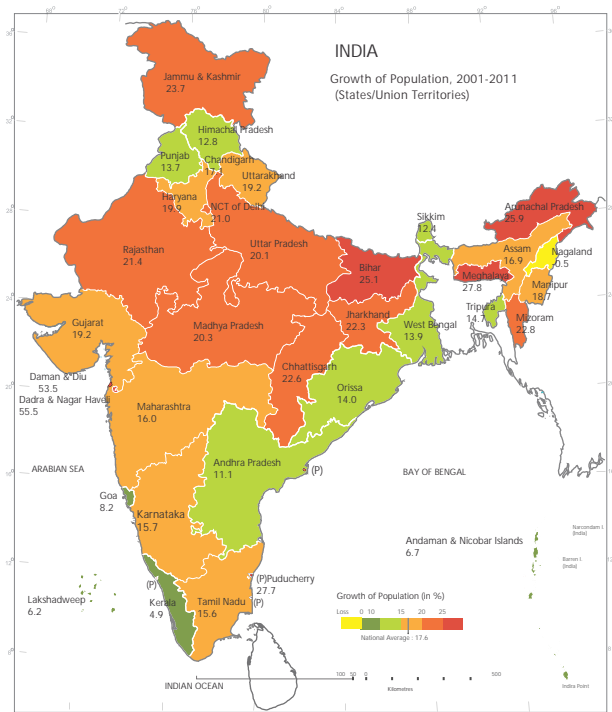
This Census 2011 has collected data down from large cities to village, town and ward level. All these valuable information/data will be useful for planning and formulation of policies for Central & State Governments; National & International agencies, scholars, business people, industrialists; Delimitation/Reservation of Constituencies - Parliamentary/



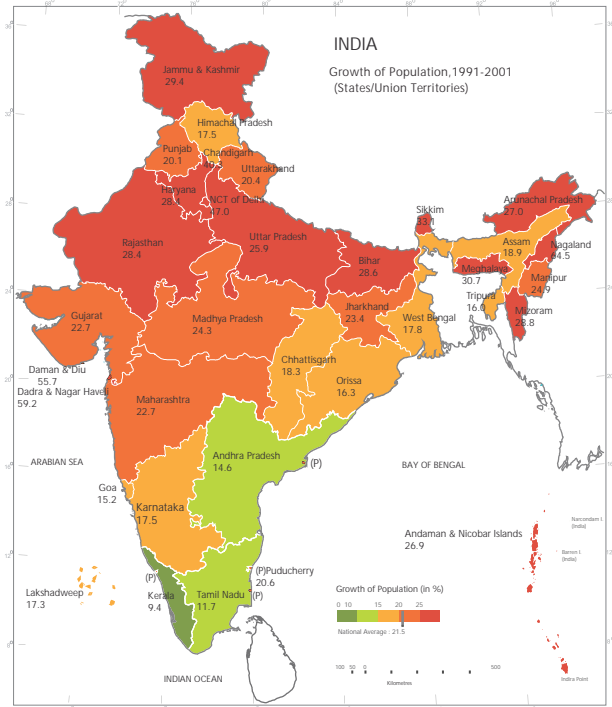
MAP 19



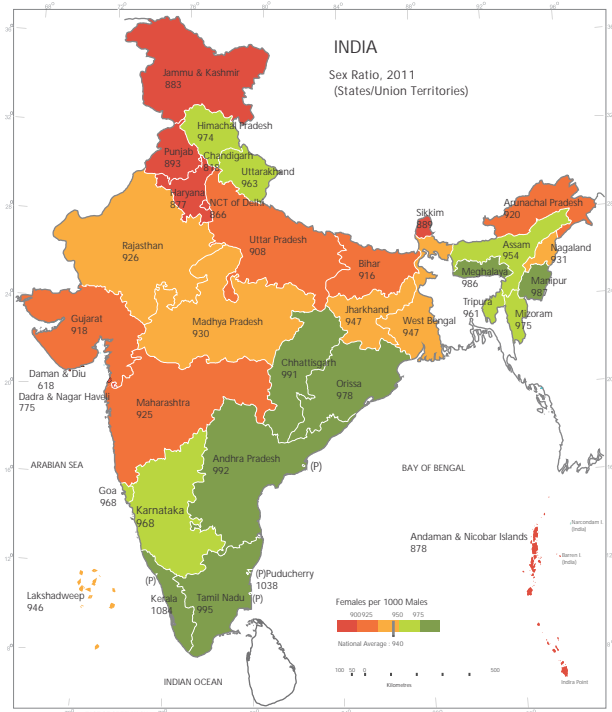
Map 7



Map 6



MAP 13



Assembly. Census has been the only organization in the country producing GIS based Thematic Maps for all kinds of valuable information on Demography (Population characteristics), Economic Activity, Literacy & Education, Housing & Household Amenities, Urbanization, Scheduled Castes and Scheduled Tribes, Language, Religion, Migration, Disability and many other socio-cultural aspects.

Houselisting and Housing Census are supported by GIS technology. The capital cities are provided with GIS based House listing block maps. These GIS based maps are used as reference and guideline on boundaries, landmarks, building numbers, etc which helped the enumerators to draw the CEB map for

restoring the information and in turn is used to update as per actual situation prevailing in the field. The enumerators are advised to update the GIS map for the changes, if any. In case of other town areas where GIS based map is not provided, the Enumerators prepared the layout maps.

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GIS for National Mapping and Charting

National mapping organizations' (NMOs) are under pressure to generate more products and services in less time and with fewer resources. On-demand products, online services, and the continuous production of maps and charts require modern technology and new workflows. Mapping organizations are responsible for managing large volumes of data and producing standardized charts and maps. GIS provides an agile, scalable architecture that supports their requirements and workflows.

Esri's GIS gives topographic mapping organizations in both the civilian and defense domains worldwide the ability to efficiently produce and maintain topographic databases and publication-quality map products. Data and map production can be streamlined, enabling mapping agencies to do more with fewer resources. Esri's ArcGIS geographic information system (GIS) technology offers powerful, database-driven cartography that is standards based, open, and interoperable. Map and chart products can be produced from large, multipurpose geographic databases instead of through the management of disparate datasets for individual products. This improves quality and consistency while driving down production costs.

Esri ArcGIS provides NMOs with reliable solutions that support scientific decision making for - E-government applications; Emergency response; Safety at sea and in the air; National and regional planning; Infrastructure management ; Telecommunications ; Climate change initiatives.

- E-government applications
- Emergency response
- Safety at sea and in the air
- National and regional planning
- Infrastructure management
- Telecommunications
- Climate change initiatives

Map, Chart, and Data Workflow

An effective workflow for map, chart and data production organizations provides solutions for collecting, managing, producing, and sharing your data. The ArcGIS suite, which leverages geodatabase technology, provides the tools map, chart and data production organizations need to complete their missions.

ArcGIS facilitates a database-centric workflow. A geodatabase, which stores text and spatial attributes together, acts as the hub to coordinate activities to collect, manage, produce and share map data. Changes can be made

at any step in the process, as opposed to following traditional linear workflows. This approach increases return on investment, improves data integrity, and decreases risk.

Collect - Centrally Compile Multiple Data Types

GIS can help you collect and perform QA/QC activities on a variety of data formats including map and text documents, vector and CAD data, imagery and raster data, photogrammetry, and GPS and field survey data.

The ability to integrate these disparate data formats and sources allows you to produce diverse map products that can display different types of data in a single document.

Manage - Take Charge of Workflows, Data, and Products

GIS provides a powerful framework for managing your data and databases. With GIS, you can manage large volumes of data while maintaining cartographic specifications.

Geodatabase technology allows you to manage data and data models specific to your requirements while fusing data from multiple sources. These tools allow you to edit data in its native format as you receive it, which helps you ensure that the data is compliant with your specifications from the beginning.

Produce - Maintaining Geographic Excellence

GIS provides a full suite of tools that allow you to analyze, report, visualize, model, and produce data and map products.

In addition to powerful cartographic tools and policies, GIS allows you to create map, data, and chart products from a centralized location that anyone in your agency can access. You can also automate workflows such as data editing and analysis to improve your production throughput.

Share - Maximise the Value of Your Data

GIS is more than just a framework for collecting, managing, and producing data and map products. GIS also provides a flexible platform for sharing and distributing maps, charts, data, metadata, Web services, and geoportals.

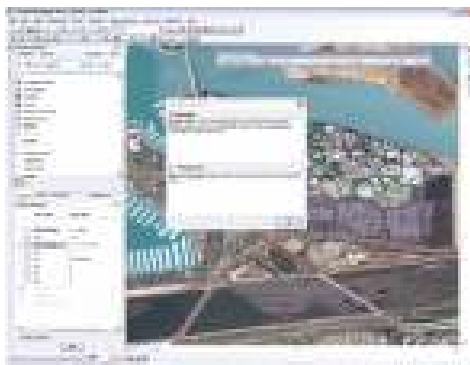
With GIS, you can disseminate your map, chart, and data products in hard copy and digital format, on the desktop, or over the Web.

Esri Production Mapping

Esri® Production Mapping helps organizations that produce authoritative geospatial content achieve economies of scale by managing and publishing accurate data and cartographic products with fewer resources. It provides a shared work environment for teams of any size to improve the quality and value of geospatial data and cartographic products through

- **Standardization**—Ensure that your geospatial content adheres to industry- and organization-specific standards by defining and distributing workflows, validation rules, data and map specifications, and more.
- **Repeatability**—Reduce data production and maintenance costs by defining your data management configurations once and reusing them multiple times.
- **Configuration**—Provide flexibility and scalability to your production environment by implementing processes and business logic specific to your organization.





Increase the efficiency of GIS data creation using on-the-fly validation.

With Esri Production Mapping, you can

- Centralize GIS workflow creation and management to ensure consistency across operations.
- Enhance user productivity by standardizing feature collection and validation, cartography, workflows, and data management.
- Streamline database development with additional templates, construction tools, and on-the-fly validation of features while editing.
- Implement an efficient and consistent review process by automating spatial data quality control tasks.
- Standardize and centralize detailed cartographic production with tools for creating and maintaining derived data, symbology, page elements, and maps.
- Access additional tools, tutorials, and preconfigured components via the ArcGIS Resource Center.



Use quality control tools for error identification, logging, correction, and verification.

Key Features

Esri Production Mapping provides content producers with tools for all contributors to generate standard data and cartographic products with exacting quality and output requirements. It also enables you to

- Streamline your production workflow with tools for allocating resources and tracking the status and progress of jobs.
- Provide a repeatable way to batch load data into a geodatabase via data load automation tools.
- Maximize usability and utility for your data production environment with powerful editing tools.
- Configure and distribute workflows that guide users through defined processes within ArcMap™.
- Assess, document, correct, and verify data quality via a complete QA/QC system with tools for automated and visual review processes.
- Simplify high-volume as well as custom digital and hard-copy map production with tools to batch create, print, and

export cartographic products.

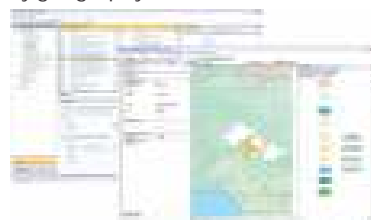
- Store production information in a spatial document management system with the ability to check out files and check in changes, search for files, manage versions, and set permissions.

ArcGIS® Workflow Manager

ArcGIS® Workflow Manager is an extension to ArcGIS Desktop and ArcGIS Server that lets organizations develop and enforce standard, repeatable geographic information system (GIS) workflows throughout the enterprise. Workflow Manager greatly improves the efficiency of GIS operations by organizing and automating the relationships between the activities in a GIS project, including any non-GIS activities that are required. Workflow creation and management are centralized to ensure consistency across operations within the organization as well as with contractors.

With ArcGIS Workflow Manager, you can

- Improve user productivity by automating common activities such as geoprocessing and version management and reducing repetition of production procedures.
- Ensure standardization and consistency across operations by quickly creating workflows using simple visual tools and centralizing workflow management.
- Automate and simplify workflow management using out-of-the-box, user-configurable tools.
- Easily track workflow status using reports.
- Integrate your GIS and other business applications by seamlessly incorporating non-GIS activities into your GIS workflows.
- Efficiently manage a dispersed workforce and assign activities by geography.



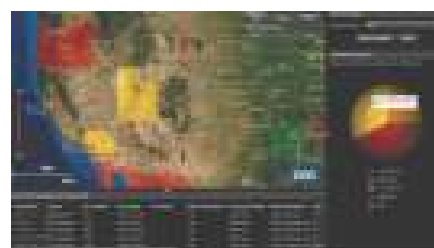
Create, manage, and execute work-flows using simple visual tools.

Key Features

ArcGIS Workflow Manager offers operational efficiency and flexibility by enabling you to

- Build workflows using intuitive visual tools to simplify the process.
- Create new workflows or enter your own, with support for a variety of activity types as well as nonlinear workflows.
- Publish workflows for use by desktop and server clients.
- Control the execution of workflows to ensure consistency in output, that no step is skipped, and that staff have the right tools to perform tasks.
- Assign activities by geography or other criteria.

Source : www.esri.com



Expose management and reporting functionality via the ArcGIS Server extension.



Mr. Swarna Subba Rao
Surveyor General of India
Survey of India

Mr. Swarna Subba Rao was appointed the Surveyor General of India in January 2010. Mr. Subba Rao joined Survey of India in 1983 and held charge of several independent offices. He has executed several survey projects including the 560 Km pipeline survey for GAIL, India. He supervised all disciplines of survey – topographic surveys, photogrammetric survey and digital cartography. He has been associated with GIS related work for the past two decades. Mr. Subba Rao is a civil engineer from Osmania University, Hyderabad and pursued M.Tech in Transportation Engineering from Regional Engineering College, Warangal, Andhra Pradesh, India, in 1983.

Q. How do you think the mapping needs of the nation have changed over the years and how is SOI planning to cater to them?

About 15 to 20 years ago, the usage of maps and awareness was very low in the country. Though accurate and detailed maps of every part of the country were produced by Survey of India and available to government departments and public, many a planners and decision makers did not make use of these maps to the extent necessary.

Since the entry of GIS technology into various walks of industry and Government which lead to the growth & awareness of Geo Spatial data usage, the demand for mapping specially in digital form and GIS compatible formats has come and in a very short time it has increased to exponential levels. Survey of India, has already completed the digitization of 1:50k mapping in OSM and DSM series and now is working on making these maps GIS compatible by adding attribute data to them. The present 1:10k mapping is also being planned to yield a GIS compatible mapping.

Q. How is Survey of India supporting the various National flagship programs such as NRLMP, NUIS, NREGA, NRHM etc?

Survey of India being the National Mapping Agency, is also been shouldering the responsibility of dissemination of spatial data as per Govt. of India's policies. Survey of India is supporting all the National Flagship Programmes mentioned

here by way of supplying spatial data and based on the need, generating additional data to suit the need of the programmes.

Q. Survey of India has embarked on the 1: 10000 mapping of the nation along with the Department of Space. Can you briefly explain the program ?

Survey of India has started the work of 1:10,000 mapping of the entire country. In this project, Deptt. of Space is also participating with Survey of India. The technical manpower and expertise available with both the departments have been synergised in this project. Deptt. of Space is supplying the necessary Satellite Imageries and are also carrying out the feature extraction component of the work where they have proven capabilities. For its part, Survey of India is generating the Topographic component, providing necessary ground control and is also carrying out the Field Verification of the maps provided using Satellite Imageries. It is also likely that the private industry will also be invited to participate in the programme to attend to the I.T intensive needs of the work. Thus, the said project is a massive collaborative program that is being coordinated and run by Survey of India.

Q. Moving ahead in the direction of National Spatial Data Infrastructure (NSDI), what has been Survey of India's role in building the same.

In NSDI, Survey General of India is the Chairman of Executive Committee and Director, NRSA is the co-chair. Survey of India

has always been the biggest supporter of NSDI since its inception. In the recent initiative of NSDI "Web Map Service", Survey of India has supplied the data for hosting it on the web by NSDI, Survey of India will continue to play its role in the development of NSDI.

Q. Today State governments are becoming spatially enabled to tackle the e-governance needs. How is Survey of India helping these state governments?

It is a welcome development that the State Governments are becoming spatially enable and are embedding spatial technology in their e-governance exercises. Survey of India's present initiative of 1:10,000 mapping is being aimed at meeting part of the needs of State Govts. in this direction. Further, whenever requested like in DSSDI Project of New Delhi, Survey of India has been extending necessary support to State Govts. in terms of providing expert services in spatial data related endeavours.

Q. What are the future mapping challenges for Survey of India and the other Mapping organisations in the country?

As the trend in the recent past suggests, the role of spatial data is going to increase in all functional areas of governance and project execution. The other mapping agencies in the country like State Govts. have to adopt uniform policies and technical procedures so that all the work done by these agencies can be integrated at the national level. Survey of

India, thus, is vested with responsibility of providing proper technical direction to these agencies. Further, disciplines in Survey & Mapping like Geodesy and Gravimetry etc. need research to be carried out at the national level, which will be done under the aegis of Survey of India.

Q. What are the different types of data available to the Geospatial community and how is it approaching the non-traditional geospatial users?

There are different types of data available with the GIS community of the country. Non-traditional users earlier had less exposure to these areas. Now, with the penetration of GIS Technologies into various functional areas, non-traditional users of Geo-spatial data have also realised the importance of Geo-spatial data and are making use of it in combination with non-spatial data.

Q. What is your strategy to position Survey of India as the Premier data provider of the country?

Survey of India being the National Mapping Agency has always been the premium agency in providing spatial data for various needs of the country. With the change in scenario due to the extensive I.T component in Digital Mapping and GIS, now Survey of India needs to re-orient its position to meet the country's spatial data needs. This is being done by upgrading the skills of the personnel of the department and adopting the latest technologies in these areas. Survey of India is making plans in these directions.

FEEDBACK

"I found Arc India News as a way to update me about the current trend and recent developments in GIS industry. Articles on Cloud Computing in recent magazine were very informative. Tips/tricks and case studies are most liked by me. Esri India should provide this magazine to all Esri software users"

Mr. K.K.Mishra
State Nodal Officer (GIS), Rajasthan Rural Road Development Agency (PWD), Jaipur, Rajasthan



I would like to thank Esri India for reaching all the GIS users with such an informative Arc India News keeping us updated with latest technological developments. The last issue focused on Cloud computing and GIS was very interesting giving us an insight into the cloud domain.

Mr. Pramod Dubey
GIS Superintendent
School of Planning and Architecture
MANIT Campus BHOPAL (M.P)

Esri approaches Futuristic GIS for Defence Solutions



Esri along with Esri India participated in the 5th Annual Geointelligence Asia conference-cum-exhibition Scheduled from 14-15 June 2011. The conference witnessed the participation from all the three forces of the Indian Defence. This two day conference was organised by GIS Development along with Directorate General of Information Systems (DGIS), Indian Army. The theme of this years conference was "GIS: Empowering the Warfighter of Tomorrow".

Esri was the Platinum Sponsors at the Geointelligence Asia 2011. There was full fledged team representing Defence vertical both from Esri and Esri India at the Conference and Exhibition to discuss and interact with the officers from all the three Armed Forces demonstrating the latest trends in the Esri GIS technology in the Defence domain.

The conference was inaugurated and addressed by Chief of Army Staff Gen V K Singh, PVSM, AVSM, YSM, ADC. During his address he mentioned how important geospatial technology is in today's warfare and the need to understand the impact on information operations. He also said that Indian defence is endeavouring to achieve capabilities for full spectrum dominance in any conflict scenario. Highlighting the importance of information, he said, "Indian Army looks at information systems that can be used by all the three services." He also emphasised on the need of having a perfect balance between traditional ways and modern means.

The other dignitaries of the Indian Army who addressed at the inauguration ceremony were Lt Gen V S Tonk, PVSM, AVSM, Deputy Chief of Army Staff (IS&T), Lt Gen N B Singh, VSM, Director General, Directorate General of Information Systems, Maj Gen Rajesh Pant, VSM, Additional Director General of Information Systems. Representing the Industry were K K Singh, Chairman Rolta Group & President, Association of Geospatial Industry, India and Dr. Christopher Tucker, Member United States Geointelligence Foundation,

John Day, Director – Defence, Esri, US, was invited as one of the Plenary Speaker at the Conference. Addressing the august gathering John Day said futuristic GIS is creating the illusion of simplicity. GIS is going beyond a single analytical workstation

to providing an eco-system to support measurement, storage, analysis, visualisation, planning, decision making and so on. There are many forces that are converging right now for instance, computing continues to evolve. Measurement is now about real-time measurement and more sensor networks. John also mentioned that governments around the world are beginning to open up now to the upcoming geospatial technologies.

Col.(retd.) Richard Sundharam, General Manager-Defence, NIIT GIS (Esri India) speaking during the Technical Session on "Asymmetric warfare – Geospatial Requirement to Counter Threats to Internal Security". He spoke about 'Creating a common operating picture for internal security operations and the problems that India faces like Naxalites, insurgencies in North East and Kashmir. He also spoke about the operation complexity that are involved in counter-insurgency operations like coping with the situation as and when they occur, reducing response time etc. He then talked about the operational challenges that are involved in tackling these operations like tracking and storing data, collection and management of data, identifying vulnerabilities and developing plans. "Geospatial technology can help us in integrating and analysing a situation, creating common picture for decision makers and executioners and aiding in carrying out a coordinated action," he said. He talked at length about common operating picture (COP). "COP assists in achieving situational awareness (SA). Effective SA involves certain challenges like it should be easy to use, access to GIS data should be from various sources, it should have the ability to perform basic analysis and have the capability to share data with the right person."

Esri displayed its latest technology on defence solutions by participating at the state-of-art exhibitions during the Geointelligence Asia. The exhibition was inaugurated and opened by the Chief of Army Staff Gen V K Singh, PVSM, AVSM, YSM, ADC. The Army chief showed great interest by visiting our booth and trying to understand the niche behind the latest ArcGIS technology that can be used for various defence solutions be it Battle Management System, Military Operations, etc.

GIS—Supporting Capability, Enabling Interoperability



The fusion of data in defense systems demands an enterprise definition of interoperability.

ArcGIS software's open architecture enables defense developers, such as Concurrent Technologies Corporation, to embed powerful GIS capabilities into C4ISR applications.

Spatial capabilities need to be embedded into defense systems in every domain and at every level of command, demanding a robust definition of openness. The ESRI® ArcGIS® platform is engineered to participate in an enterprise information system environment. Interoperability is built into the heart of the ArcGIS scalable family of software products. This ensures the sharing of spatial data and applications throughout defense enterprises.



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Filariasis Risk Mapping of Tamil Nadu

Hari Kishan Raju. K

The main mosquito-vector borne diseases (VBD) in India are malaria, filariasis, JE, leishmaniasis dengue, and chikungunya. Understanding the determinants of these diseases and their spread is vital in planning and for any surveillance. Spatial distribution and prediction maps provide necessary details for understanding disease spread and its relation with surrounding environment. Especially in VBD's, vectors and their disease distribution is mainly influenced by surrounding environments and the use of GIS in health sector will increase the ability to understand VBD's distribution and their association with environmental factors. In India the interest of using GIS in health sector started during the late 1990s and increasing day by day. Many health research organizations, such as Vector Control Research Centre (VCRC), National Institute of Malaria Research (NIMR), C..RME, N..IE, and N..IV etc., are exploring its potential utility in health problems.

Lymphatic filariasis is one such disease; its distribution is mainly governed by environmental conditions [1]. This implies that the risk of filariasis can be defined in a geographical area, as there is local variation in the environmental conditions. Using this conception, the geo-environmental risk model developed on a GIS platform at VCRC, it helped for spatial delimitation of filariasis risk on a macro scale in Tamil Nadu [2].

Study area

Tamil Nadu is one of the southern India represents a wide range of geo-environmental features. The study area (1,30,058 sq. km) lies between 8° 27' 2" N – 18° 20' 55" N and 74° 16' 17" E – 80° 11' 45" E. This area receives monsoon rainfall, i.e., South-West (June – Sep.) and North-East (Oct. – Dec.). The rainfall is moderate to high, with an annual average of 800 mm to 3000 mm. The mean annual temperature is 25°C – 27.5°C. Altitude ranges, sea level to 1800 m. Major soil types include: (i) Red sandy soil, (ii) Red loamy soil, (iii) Red and mixed black soil, (iv) Black soil and (v) Alluvial soil. The total population of the study area is 56.3 million (Source: Census of India 2001). The population density ranges from 106 to 3917 persons per sq. km.

Methodology

The possible geo-environmental risk factors that are likely to influence the occurrence of Lymphatic filariasis were identified; accordingly altitude, temperature, rainfall, relative humidity and soil type thematic layers were developed for Tamil Nadu area on GIS platform using ArcGIS 8 software. All these variables either individually or in combination are known to be associated with the occurrence of filariasis [3, 4]. We have identified the ranges of these variables that are apparently conducive for the transmission of filariasis. Multivariate analysis also confirmed the variables association with the disease occurrence in the study area.

These values of variables were used for calculating a composite index, to create filariasis transmission risk index (FTRI) for developing the model.

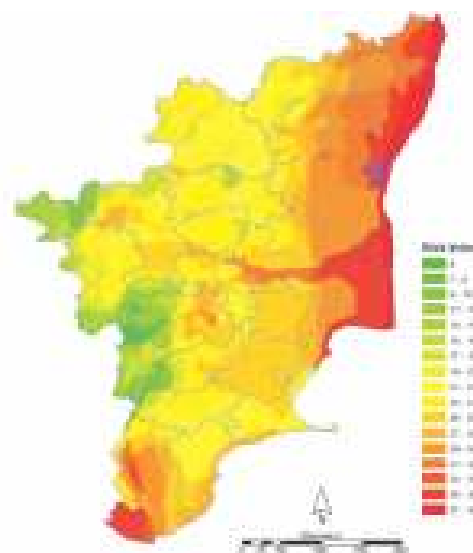
The model customized the environmental parameters, encompassing the ranges of different variables associated with transmission of filariasis.

FTRI for an area =

Where $\sum Y_i = Y_1 + Y_2 + Y_3 + Y_4 + Y_5$

Y1, Y2, Y3, Y4 and Y5 are scores for Altitude, Temperature, Relative Humidity, Rainfall and Soil type respectively.

This model was used to identify the areas to assess the potential for risk of filariasis transmission in Tamil Nadu, and filariasis transmission risk map for Tamil Nadu has been developed using these FTRI values for an area.



Higher values or red colour of the map indicates the higher degree of risk and lower values or green colour indicates the low risk of those areas.

Conclusion

GIS and RS are increasingly used for the study of spatial and temporal patterns of vector borne diseases. The geo-environmental risk model developed on a GIS platform is very useful for spatial delimitation of filariasis risk on a macro scale, and further facilitating decisions in selection of areas for filariasis elimination programmes and vector control measures by health officials.

References:

1. Srividya A, Michael E, Palaniyandi M, Pani SP, Das PK: A geostatistical analysis of the geographic distribution of lymphatic filariasis prevalence in southern India. *The Am J Trop Med & Hyg* 2002, 67(5):480-489.
2. Sabesan S, Raju HK, Srividya A, Das PK.: Delimitation of lymphatic filariasis transmission risk areas: a geo-environmental approach. *Filaria J*. 2006 Nov 9;5:12.
3. Brooker S, Michael E: The potential of geographical information systems and remote sensing in the epidemiology and control of human helminth infections. *Advances in Parasitol* 2000, 47:246-288.
4. Berquist NR: Vector-borne parasitic diseases: New trends in data collection and risk assessment. *Acta Trop* 2001, 79:13-20.

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100% Scholarships for MTech (GIS)

Overview

GIS is a multi-billion dollar industry globally, that has appeared regularly on the top ten lists of technologies for the future. The central government of India plans to spend approximately \$ 1.4 Billion on geospatial technologies under the National GIS program-a nationwide GIS that will support all sectors of governance, enterprise and citizens. This will create a huge demand for high quality GIS professionals and researchers. In India, several Universities face severe resource crunch and lack partnerships with global organizations to update their GIS facilities and course curriculum that is relevant to the industry. NIIT University has taken cognizance to this serious issue and plans to offer MTech (GIS) program in association with the world's leading GIS company Esri Inc., California, USA. 100% scholarship will be made available to the students.

NIIT University's MTech GIS Program

NIIT University's (NU) proposed MTech (GIS) will be a two-year intensive program designed for professionals having work experience of 2 or more years in the geospatial arena and with diverse academic qualifications ranging from Geography/

Engineering/ Geology and Environmental Sciences degree. The proposed program will expose students to real life projects using technologies that are current and industry relevant. On successful completion of the M.Tech program; students will be offered appropriate placement with various leading organizations including Esri India.

About NIIT University

Nestled in the foothills of Aravali, in Neemrana, Rajasthan the picturesque 100-acre fully residential Green campus of NU is equipped with state-of-the-art technology-enabled teaching methodology backed by a strong research-focused curriculum for facilitating a continuous process of learning and development.

Set up in 2009, with the vision of being the leading centre of innovation and learning in emerging areas of the Knowledge Society, NU has been developed as an institute of excellence based on the four founding principles of providing industry linked, technology based, research driven, seamless education.

Contact

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Neemrana, NH – 8, Delhi – Jaipur Highway, District Alwar, Rajasthan – 301 705

Geospatial Applications at Visvesvaraya National Institute of Technology, Nagpur



About VNIT

Named after the great Engineer, Statesman & Visionary of modern India, Visvesvaraya National Institute of Technology, Nagpur (VNIT) was established in 1960 and over the past 50 years, VNIT has established itself as a leading institution in engineering education.

Remote Sensing was introduced as a part of the curriculum way back in 1996 by Prof. Y.B.Katpatal, with the vision to impart to the students the technology which could effectively introduce transparency into governance. Dr. Y. B. Katpatal who is I/c of the RS & GIS Lab. of Civil Engineering Department at VNIT. With due advent of Remote Sensing and GIS technology, a full-fledged GIS lab was established in the department in 1999.

Geoinformatics Courses at VNIT

A course titled "Remote Sensing & GIS" is offered as an open course for the UG as well as PG students. This course is meant to introduce to the students the preliminary concepts of remote sensing and GIS and its applications in various fields. An advanced course titled "Advanced Spatial Analysis for Resource Management" is offered for the PG and UG students. UG, PG and Ph.D. projects are also undertaken.

Interested students are also encouraged to take up summer trainings at Regional Remote Sensing Centre (RRSC – ISRO), Maharashtra Remote Sensing Applications Centre (MRSAC) and private organizations in geospatial applications at Nagpur.

Facilities

VNIT has a fully equipped RS & GIS Laboratory setup in the Department of Civil Engineering under the supervision of Prof. Y.B.Katpatal. The laboratory has licensed copies of latest image processing software like ERDAS Imagine and ArcGIS. The laboratory is also equipped with Multi Band Radiometer (MBR), GPS, Ground Penetration radar, and Plotter. The lab is also intending to upgrade to much more advanced software for image processing and GIS.

Research Activities

The GIS lab has always instigated and encouraged students to



take up research projects. In its endeavour, the lab carries out research work in the field of water resource management, environment management and on an overall spatial domain. It is noteworthy that over 30 M.Tech and 10 Ph.D students have completed their project at RS & GIS lab and numerous research and consultancy projects have also been completed. The institute also intends to further increase industry interaction and start new courses in geoinformatics.

The research work published in various leading international and national journals include applications in water resources and environmental impacts and generating spatial decision support systems. One of the recent research works was adjudged the best paper at the Geospatial World Forum 2011 and was awarded the Kamakshi Gold Medal.

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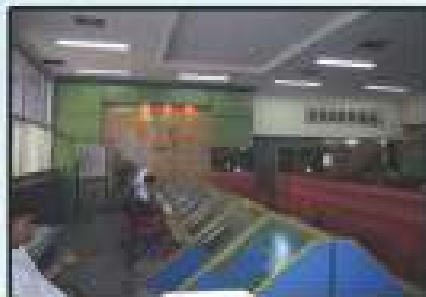
Urban & Municipal GIS



Disaster Management



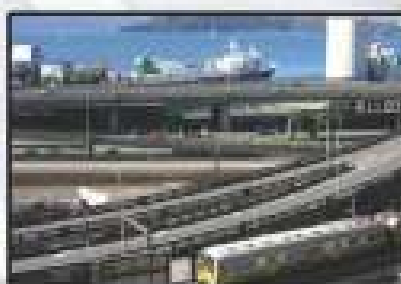
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E-Governance



Utilities



Infrastructure



Land Records &
Property Tax Management



Natural Resource Management



Rural Development



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Email: info@esriindia.com ; Tel: +91 11 40570700 / 701

ArcLogistics: The Routing and Scheduling Solution for Fleet Management

ArcLogistics is a complete solution for complex routing and scheduling problems and helps you minimize costs, maximize productivity, and improve customer service. Offering a quick and significant return on investment for fleets of all sizes, ArcLogistics lends itself to fleet management across all organizations including food and beverage; manufacturing and delivery; medical services and supplies; courier and messenger services etc.

Key Features

ArcLogistics features the following:

- Nontechnical workflow-based user interface
- Building routes based on network drive times, distances, and restrictions, not straight-line distances
- Scheduling by calendar days
- Specifying route recurrence by day of week
- Building default routes with different driver/vehicle combinations
- Taking into account specialties of vehicles, drivers, and orders
- Importing customer orders and locations from Microsoft® Excel®, Access®, text, and dBASE files or shapefiles.

Working with ArcLogistics

I. Choosing a project

1. Click New Project on the Main toolbar. The New Project dialog box opens.
2. Type a name for the routing project.
3. Specify the location of the routing project file. The default location is in the Projects directory.
4. Browse to the Map Template of your street database. The file will have a filename extension of mxd.
5. The Network Dataset field should be populated with a default network dataset file when you select the map template file. You can over-ride this, if necessary, and browse to another network dataset.
6. The Locator field should be populated with a default locator. You can override this, if necessary, and browse to another locator.
7. Click OK.



II. Adding a location

1. Right-click Locations in the service area tree, then click New Location, or click Add/Edit Locations on the Main toolbar.
2. Type a name for the location.
3. Type the full address of the

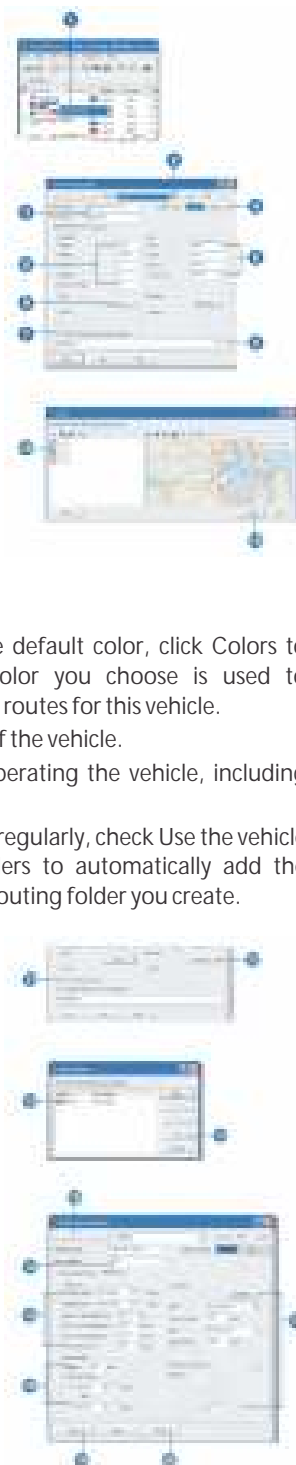


location.

4. Specify the hours that the location opens and closes each day.
5. If desired, type some comments about the location.
6. Click Save.
7. If you want to add another location, click New, and then repeat steps 2 through 6.
8. When you're finished adding locations, click Close.

III. Adding a vehicle


1. Right-click Vehicles in the service area tree, then click New Vehicle.
2. If you already have at least one vehicle set up, you can make single copy of it by clicking the Copy drop-down arrow and picking the vehicle you want to copy from the list. Then change information to represent the new vehicle.
3. Type the vehicle name and driver name.
4. If you don't like the default color, click Colors to choose one. The color you choose is used to symbolize orders and routes for this vehicle.
5. Enter the capacities of the vehicle.
6. Enter the costs of operating the vehicle, including the driver's wages.
7. If you use the vehicle regularly, check Use the vehicle in new routing folders to automatically add the vehicle to each new routing folder you create.
- If you wish, type comments about the vehicle.
8. To assign a zone, click Zones.
9. Click the checkbox beside each of the vehicle zones and click OK.
10. If you are using polygon zones and you want to make them hard zones, click Treat Zones Hard.
11. To assign specialties, click Specialties.
12. Click the checkbox



beside each of the vehicle or driver's specialties and click OK.

13. Click the Work Day tab.
14. Enter work day information.
15. Enter lunch information.
16. Enter location information.
17. Click Save.
18. To set up another vehicle, click New and repeat steps 2 through 18.
19. When you've finished, click Close.

IV. Importing orders

1. In the Tree View, right-click Orders Inbox, or right-click Unassigned orders in a routing folder. 
2. Click Import. 
3. To use an existing Order Import profile, click the drop-down arrow and click the name of the profile; otherwise, click <new import profile>. 
4. To import orders based on the profile, click Import. 
5. Click Next to continue.
6. Click Orders or Trip requests.
7. Click Next.
8. Click the option that identifies where you want the orders imported.
9. Click Next.
10. Choose how the database will be accessed.
11. Click Next.
12. Click Browse if you are accessing the file directly.
13. Navigate to the file that contains the order information.
14. Click the file.
15. Click Open.
16. Click Next.
17. Click the drop-down arrow, and then click the table that contains the orders.
18. Click Next.
19. Click and drag each corresponding field from the left list to the matching field in the right list. 
20. Click Next.
21. Click the option that identifies how you want to handle duplicate orders. 
22. Click Next.
23. Type a name for the import profile, if you want.
24. Check Save this Import Profile to save the profile.

25. Click Finish.

V. Building routes

1. Click the routing folder for which you want to create routes.
2. Click Build Routes on the Main toolbar.



VI. Creating a report

1. The manager summary report provides management with performance statistics which can be used to analyze overall routing efficiency.
2. Route manifest reports can be given to your drivers to help them complete their route. Manifests list customers in the sequence they are scheduled to be visited. You can also include travel directions, a map of the entire route, and a map of the vicinity around each customer.
3. The dispatcher summary report provides dispatchers with an overall view of the workload



Web Method Name: Animated Graphic Symbols for Different Geometries

Input Parameters to web method: Geometry

Output: Geometry displayed with animated graphic symbols

Environment: Windows

Version: Silverlight, ArcGIS API for Silverlight 2.1

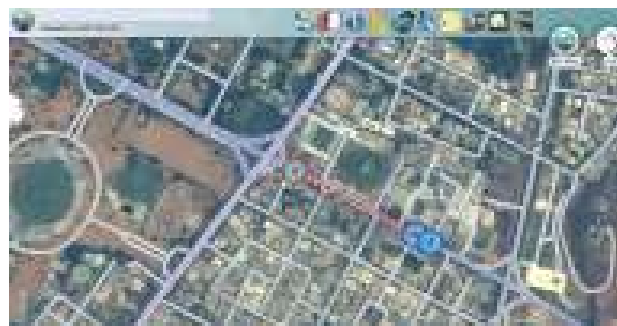
Description:

The following code is used to display graphic with animated symbols for different types of geometry e.g. Point, Polyline and Polygon.

XAML Code Snippet:

```
<ResourceDictionary
xmlns="http://schemas.microsoft.com/winfx/2006/xaml/presentation"
xmlns:x="http://schemas.microsoft.com/winfx/2006/xaml"
xmlns:esrib="clr-namespace:ESRI.ArcGIS.Client.Symbols;assembly=ESRI.ArcGIS.Client">
//code for point
<esrib:MarkerSymbol
x:Key="SelectedPointSymbol" OffsetX="12"
OffsetY="12">
<esrib:MarkerSymbol.ControlTemplate>
<ControlTemplate
xmlns="http://schemas.microsoft.com/client/2007"
xmlns:x="http://schemas.microsoft.com/winfx/2006/xaml">
<Grid x:Name="RootElement"
RenderTransformOrigin="0.5,0.5">
<Grid.RenderTransform>
<ScaleTransform ScaleX="1" ScaleY="1" />
</Grid.RenderTransform>
<VisualStateManager.VisualStateGroups>
<VisualStateGroup
x:Name="SelectionStates">
<VisualState
x:Name="Unselected"></VisualState>
<VisualState x:Name="Selected">
<Storyboard RepeatBehavior="Forever">
<DoubleAnimation BeginTime="0:0:0"
Storyboard.TargetName="RootElement"
Storyboard.TargetProperty="(UIElement.RenderTransform).(ScaleTransform.ScaleX)"
To="2.5" Duration="0:0:1" />
<DoubleAnimation BeginTime="0:0:0"
Storyboard.TargetName="RootElement"
Storyboard.TargetProperty="(UIElement.RenderTransform).(ScaleTransform.ScaleY)"
To="2.5" Duration="0:0:1" />
<DoubleAnimation BeginTime="0:0:0"
Storyboard.TargetName="RootElement"
Storyboard.TargetProperty="(UIElement.Opacity)"
From="1" To="0.5" Duration="0:0:1" />
</Storyboard>
</VisualState>
</VisualStateGroup>
</VisualStateManager.VisualStateGroups>
<Ellipse x:Name="Ellipse" Width="24"
Height="24">
```

```
<Ellipse.Fill>
<RadialGradientBrush
GradientOrigin="0.5,0.5" Center="0.5,0.5"
RadiusX="0.5" RadiusY="0.5">
<GradientStop Color="#EE0000FF"
Offset="0.0" />
<GradientStop Color="#EE00FFFF"
Offset="0.5" />
<GradientStop Color="#EE0000FF"
Offset="1.0" />
</RadialGradientBrush>
</Ellipse.Fill>
</Ellipse>
</Grid>
</ControlTemplate>
</esrib:MarkerSymbol.ControlTemplate>
</esrib:MarkerSymbol>
```



```
//code for line
<esrib:LineSymbol
x:Key="SelectedLineSymbol">
<esrib:LineSymbol.ControlTemplate>
<ControlTemplate
xmlns="http://schemas.microsoft.com/client/2007"
xmlns:x="http://schemas.microsoft.com/winfx/2006/xaml">
<Grid x:Name="RootElement">
<VisualStateManager.VisualStateGroups>
<VisualStateGroup
x:Name="SelectionStates">
<VisualState
x:Name="Unselected"></VisualState>
<VisualState x:Name="Selected">
<Storyboard RepeatBehavior="Forever">
<DoubleAnimation BeginTime="00:00:00"
Storyboard.TargetName="Element"
Storyboard.TargetProperty="StrokeDashOffset"
To="1000" Duration="0:3:0" />
</Storyboard>
</VisualState>
</VisualStateGroup>
</VisualStateManager.VisualStateGroups>
<Path x:Name="Element"
StrokeDashArray="2,1" StrokeDashOffset="0"
Stroke="#EE00FFFF" StrokeThickness="3" />
</Grid>
</ControlTemplate>
</esrib:LineSymbol.ControlTemplate>
</esrib:LineSymbol>
//code for polygon
<esrib:FillSymbol
```



```
x:Name="SelectedFillSymbol">
<esrisb:FillSymbol.ControlTemplate>
<ControlTemplate
xmlns="http://schemas.microsoft.com/client
/2007"
xmlns:x="http://schemas.microsoft.com/winfx
/2006/xaml">
<Grid>
<VisualStateManager.VisualStateGroups>
<VisualStateGroup
x:Name="SelectionStates">
<VisualState
x:Name="Unselected"></VisualState>
<VisualState x:Name="Selected">
<Storyboard RepeatBehavior="Forever">
<DoubleAnimation BeginTime="00:00:00"
Storyboard.TargetName="Element"
Storyboard.TargetProperty="StrokeDashOffset"
To="1000" Duration="0:3:0" />
</Storyboard>
</VisualState>
</VisualStateGroup>
</VisualStateManager.VisualStateGroups>
<Path x:Name="Element" Fill="#330000FF"
Stroke="#EE00FFFF" StrokeDashArray="2,1"
StrokeDashOffset="0"
StrokeThickness="3"></Path>
</Grid>
</ControlTemplate>
</esrisb:FillSymbol.ControlTemplate>
</esrisb:FillSymbol>
</ResourceDictionary>
//C# Code snippet
void
```

```
AddGraphicToMap(ESRI.ArcGIS.Client.Geometry
y.Geometry pGeometry)
{
//Initialize a Graphic Layer
GraphicsLayer IncidentsGraphicsLayer =
this.MapControl.Layers["MyIncidentsGraphic
sLayer"] as GraphicsLayer;
//Clear the Graphics
IncidentsGraphicsLayer.ClearGraphics();
// Create a Graphic with the drawn
geometry
Graphic graphic = new
ESRI.ArcGIS.Client.Graphic();
graphic.Geometry = pGeometry;
//Switch case to check the type of
geometry and select symbols accordingly
switch (e.Geometry.GetType().Name)
{
case "MapPoint":
graphic.Symbol =
this.LayoutRoot.Resources["SelectedPointSy
mbol"] as MarkerSymbol; break;
case "Polyline":
graphic.Symbol=
this.LayoutRoot.Resources["SelectedLineSym
bol"] as LineSymbol; break;
case "Polygon":
graphic.Symbol= this.LayoutRoot.Resources
["SelectedFillSymbol"] as FillSymbol; break;
//Adding Graphics to the
IncidentsGraphicsLayer
IncidentsGraphicsLayer.Graphics.Add(graphic)
;
}
```

Letters to Editor

Dear Readers,

This section of Letters to the Editors is a new inclusion to Arc India News. We would like to have the opinion and feedback of all our readers with respect to the content being published and how it has been useful to them in their day to day GIS advancement. You may also let us know what you expect to see in terms of applications and technology in the magazine.

Letters to the Editors may be edited for length and/or clarity and may be published or republished by us in any format or medium and/or licensed to others for publication. If we publish our letter, we may attribute it to you and may include your name and city, unless you expressly request that you remain anonymous. Please share your thoughts with us at info@esriindia.com

Editorial Board

Esri Creates Ocean Basemap

Esri created and released a new, comprehensive map of the world's oceans and coastal areas. The Ocean Basemap is now available as a cached map service in ArcGIS Online. The first basemap of its kind, the Ocean Basemap is designed to support a variety of maritime GIS applications.

Esri's Ocean Basemap greatly expands the ocean content that's currently available in Esri's online basemaps. Traditional basemaps of the ocean have small scales and only include coarse-grained views of features. The Esri Ocean Basemap includes fine-grained bathymetric and altimetric data from coastal areas, where most of the human activity takes place.

Authored down to a scale of 1:1,000,000, the Ocean Basemap is built using a variety of publicly available authoritative ocean data. For scales from 1:1,000,000 down to 1:36,000, the Ocean Basemap uses the Community Maps model of seeking authoritative user content. Users can contribute data to the Ocean Basemap, just as they add data to any other basemap.

The Ocean Basemap was created with uniform cartography for consistency and a muted color palette, which makes it ideal for overlaying additional user-specific content or content from ArcGIS Online. Maritime professionals such as hydrographers, port authorities, and coastal zone planners now have a consolidated source of information to access when conducting research and creating their own maps.

To start using the Ocean Basemap, visit www.arcgis.com



Poland Implements Esri-Based INSPIRE Solution

Spatial Data and Services Will Be Accessible throughout the Country

The Head Office of Geodesy and Cartography in Poland (GUGiK) is implementing an Esri-based solution to support compliance with the European Union's Infrastructure for Spatial Information in Europe (INSPIRE) Directive. The directive sets out a framework and timetable for implementing a pan-European spatial data infrastructure (SDI) to address multinational and multi-agency issues. GUGiK is the central state administration unit responsible for national policy related to geodesy and cartography.

Esri's ArcGIS technology will be used to create GUGiK's GeoPortal2, a project designed to improve access to government datasets and provide mapping and survey services to other government agencies, citizens, and businesses.

GeoPortal2 includes Esri's ArcGIS for INSPIRE product as well as software from Esri business partner con terra GmbH. The project is being implemented by Esri distributor ESRI Polska sp. z o.o.; Esri partner GISPartner; and the largest IT company in the country, Asseco Poland SA.

- GeoPortal2 is scheduled to be completed in November 2012 and will include
- Geographic names and addresses throughout Poland
- Integrated and unified distribution of spatial data services defined by the INSPIRE Directive
- Streamlined and improved data maintenance
- Digital archive of spatial data for the central registry of data
- Uniform maintenance on all orders of data products and services
- More accurate monitoring of distributed resources

"ESRI Polska is excited by this opportunity and fully committed to working with GUGiK to implement this strategic project successfully," says Lech Nowogrodzki, president, ESRI Polska. "We look forward to making a real difference to the development of Poland's, and Europe's, SDI."

Passed by the member states of the European Union and the European Parliament, INSPIRE's goal is to tie European geospatial information producers and users together into a single community to improve decision making and operations for a productive and sustainable Europe.

For more information about ArcGIS for INSPIRE, visit esri.com/INSPIRE.