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Event Coverage

ESRI INTERNATIONAL USER CONFERENCE 2009

Modernising Healthcare through GIS

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ArcIndia News

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From the President's Desk

Dear Friends,

ESRI completes 40 years this year – a major landmark in the GIS industry that has innovated and created a new landscape for geo-spatial technology and applications across the world!!! From an Indian perspective, ESRI technology entered India in mid 1980s (as I remember) and I would say about 25 years back. During these periods, ESRIs GIS has come a long way - leaving imprints that have impacted many a community and has created a cadre of GIS professionals across the globe. We in ESRI India are thrilled to be a part of this "GIS Movement". We have progressed through many challenging times, but we have always kept our large base of clients as our TOP PRIORITY; we have focussed on user needs and on the mission of evolving the environment of GIS and promoting the value of spatial thinking in India.

The "technical capability" of ArcGIS over the 40 years is its success and bears out in how a complex GIS technology must be nurtured and developed as a techno-business model. With ESRI we give you a GIS ROADMAP (that has developed for past 40 years and the vision for next 5-10 years is on ahead of us) where we realise the REAL CHALLENGE is in innovation and anticipation of user needs and cater to them with timely and well-supported software solutions. As we envision, DATA: APPLICATIONS: SYSTEMS – ALL GEOGRAPHIC.

We strive to work for the user community and our tasks are spawned over a large global enterprise of ESRI professionals. While ArcGIS products are unique in functionality, the releases are also unique every time – offering new and innovative features that balances functionality, quality, efficiency, timeliness and thus making ArcGIS software easily-usable, customisable and extendable. All this enables a wide canvas of applications which are individual-centric through Project-centric and now Enterprise-wide work-flow solutions. We highly focus on Training - develop advanced training materials to help grow the technical skills and related knowledge of our users. Very soon ESRI plans to embark on ESRI Certification of professionals – creating a ESRI cadre to address the immensely large GIS requirements.

ArcGIS technology also helps users implement complex GIS projects or Enterprise GIS system implementations – grappling with combination of varied technologies (example, the recent APDRP initiative where ArcGIS and ArcFM combination integrates seamlessly with a variety of IT elements), setting standards for (many times unknown) data quality, and develop applications (often with frequently changing requirements that sometimes easily lead to slipping schedules and cost overruns) – but we make it a success for our users to see the value of ESRI solutions. Often we find users undertake GIS projects on the cutting edge of ESRI technology or demonstrate for the first time that GIS can benefit a particular application/enterprise area. We openly communicate the risks of these projects and collaborate with our customers as "ONE". These are some of the value-systems that we bring to you with the ESRI platform.

Our future plans for our users are quite ambitious and grounded in our experience – mainly to provide the best of combinative spatial technology platforms that will be unique - by evolving platform technologies, standards, and the emergence of new ideas and methods of geo-spatial processing (you will see many exciting features in ArcGIS 9.4, so watch out!!!) that will bring immense geo-spatial processing capability in your hands. We will also bring Partner products that will complement ArcGIS and bring you a "common suite" across GIS processing requirements – be it on survey data, images, maps, ERP data, mobile collections or even just hand-sketches.

In India, GIS is on a surge and we see immense opportunities for GIS Solutions in Urban, Power, Infrastructure, Agriculture, Rural Development, Defence, Land Records, Forests/Environment, E-Governance and many other sectors – the prospects are just limited by imaginative-GIS. We partner with some of the best Sis in India who take on the tasks of building a wide canvas of applications and build the blocks of a national GIS Enterprise.

As we work to meet the growing GIS demand in India, we also pride ourselves that we help build a geo-spatial workforce that are required to meet the challenges of many a agency, state, enterprises and the nation as a whole. We are proud to have you as an esteemed member of the large ESRI family and GIS culture. And through your valuable contribution we commit ourselves to promote the right-value of GIS throughout the country. Our work and technology must make a difference to all of you and we believe that GIS-enabled SYSTEMS really matters in governments, business, education, science, and to common citizens.

Thank You and wish you all a successful GIS era,

Mukund Rao
President & COO

Global GIS community Lauds Dr. K. Kasturirangan for 'Making A Difference'

Dr K Kasturirangan, Member (Science), Planning Commission, was honoured for "Making a Difference" by the global GIS community for his significant contribution in the field of Remote Sensing and GIS at the recently concluded 2009 ESRI International User Conference, held during July 13-17 at the San Diego Convention Center in California, USA.

Dr. K.Kasturirangan has made far-reaching contributions to the global community of Remote Sensing and Geographic Information System (GIS). Dr Kasturirangan has been the key person to have taken IRS images to the world and also in making the use of images in India to large applications on natural resources management, disaster management support and for national development. In his drive for the use of spatial technology, Dr Kasturirangan has championed the extensive usage of satellite imagery and GIS to bring great value and benefit to society and individuals. Dr Kasturirangan has spearheaded the National Natural Resources Management System (NNRMS) under which the largest GIS project of Natural Resources Information System (NRIS) has been organized in almost all states of the country. He was also the key visionary to conceptualise and steer the establishment of Indian's National Spatial Data Infrastructure (NSDI). For these achievements, Dr Kasturirangan received the "Making a Difference" award from Jack Dangermond, President, ESRI Inc., USA in front of more than 12,000 GIS delegates at the 2009 ESRI International User Conference.

"Dr Kasturirangan's pioneering work in deploying GIS technology in different spheres should add rigour to all areas of work of the Planning Commission" said Mr R S Pawar, Chairman of NIIT-GIS Limited (ESRI India).

"He makes an enormous difference because of the integration of remote sensing into GIS and also the tremendous focus he has created on applications. Dr. Krishnaswamy Kasturirangan is going to be a master of bringing geography to virtually everywhere in India and will be an example for all of us" Jack Dangermond, President, ESRI Inc., said in presenting the award.

In an interview to ESRI after the award ceremony, Dr Kasturirangan said that he accepted the "Making a Difference" award on behalf of the dedicated team at IRSO, various government and private sector agencies in India that are sharing a common GIS goal and the large number of GIS and remote sensing technology professionals throughout the world. "GIS is an important tool for bringing transparency and scientific method in governance and decision-making. GIS is all pervasive and touches almost all aspects of society – be it citizens, private enterprise or government. India has been a major leader in GIS and has played an important role in the international community in shaping Imaging and GIS thoughts and concepts. I am happy to be a part of this GIS community" Dr Kasturirangan said.

INCOIS Receives Special Achievement in GIS (SAG) Award for the Exceptional Use of GIS Technology

The Indian National Centre for Ocean Information Services (INCOIS), Hyderabad, received the Special Achievement in GIS (SAG) Award at the 2009 ESRI International User Conference (ESRI UC) in San Diego, California. The organization received this honor for its vision, leadership, and innovative use of ESRI's geographic information system (GIS) technology. INCOIS was selected from more than 300,000 organizations worldwide and recognized during SAG awards ceremony at ESRI International User Conference for making extraordinary contributions to our global society. The Award was received by B. V. Satyanarayana, Head, Computational Facilities and Web based Services Group, INCOIS.

INCOIS provides a number of oceanographic services to the Indian Ocean region. The organization directly impacts the lives of millions who are dependent on the coastal areas and are also directly vulnerable to the effects of natural disasters. For example, the organization's Tsunami Warning Centre notifies local residents that a tsunami may be approaching. GIS tools are also used to generate and analyze spatial data. The INCOIS Potential Fishing Zone Advisories identify areas where fish activity is high. These advisories have proven to be helpful in reducing fisherman search time by 60 to 70 percent, thereby reducing fuel consumption and valuable human effort. Users can perform analysis and customize personal maps. Furthermore, location-based services are provided by sending alerts on mobile phones.

"Our world is being challenged by rapid change," says Jack Dangermond, ESRI president. "GIS technology is increasingly being deployed as a way to understand the issues facing our society. At ESRI, we are always extremely impressed with the work of our users and want to recognize their efforts with our Special Achievement in GIS Award. Their work is a great example of using GIS to improve our world."

On this occasion Dr. Shailesh Nayak, Secretary, Ministry of Earth Sciences cited that "The award is recognition of great team effort in Utilising Geospatial Technology for the societal benefit". Congratulating INCOIS on receiving the SAG award, Dr. Mukund Rao, President and Chief Operating Officer, ESRI India said, "It is an honor for GIS users in India that INCOIS has been chosen for this coveted award. We are proud to be associated with this state-of-art information system built using ESRI technology to provide early warnings for tsunami and coastal hazard mitigation"

NIIT GIS President honored with National Geo-Spatial Excellence Award

New Delhi, September, 2009: NIIT GIS Limited has been in the forefront of Geographic Information Systems (GIS) in India. The company offers a wide range of GIS Solutions based on ESRI Technology worldwide to help governments and public undertakings leverage GIS in order to make more informed management decisions and provide enhanced service to its constituents.

Dr Mukund Rao, President and Chief Operating Officer, NIIT GIS Ltd. has been honored with National Geo-Spatial Excellence Award by Indian Society of Remote Sensing (ISRS).

The award was presented by Dr. Shailesh Nayak, Secretary, Ministry of Earth Sciences and President, ISRS, at a felicitation ceremony held at Nagpur, India. Dr. Rao has made extensive contributions to the Indian community in Remote Sensing and Geographic Information System (GIS).

"GIS is an effective tool for governance and decision-making for large government programs. Dr. Mukund Rao's innovative work in deploying GIS technology has contributed to numerous value-added applications. He has made a difference by integrating remote sensing with GIS." said Mr. Arvind Thakur, CEO, NIIT Technologies Ltd.

NIIT GIS Ltd. brings horizontal and vertical integration of satellite/aerial imagery, Remote sensing, Photogrammetry, GPS Applications, GIS web services & Portals, and enterprise solutions. The company has vast experience in seamless integration of spatial technology and conventional IT solutions and has emerged as leaders in the geospatial technology arena with the largest share in the Indian market.

Karnataka chooses ESRI Technology for Disaster Management Portal

New Delhi, August, 2009: The Karnataka State Natural Disaster Monitoring Centre (KSNDMC), an autonomous body under the Department of Science and Technology, Government of Karnataka, has the major responsibility to monitor and pro-actively provide advanced information on natural disasters in the state of Karnataka. The Centre integrates the data collected by in-situ measurements, imaging and secondary data from various state and central Government agencies - Meteorology, Agriculture, Horticulture, Surface and Ground Water Resources, Dry Land Farming, Water-shed Development, Soil Survey, Surface Water Resources, Command Area Development and many others. KSNDMC provides Decision Support information on disasters to various government agencies and community agencies in the form of graphs, maps and tabulated data.

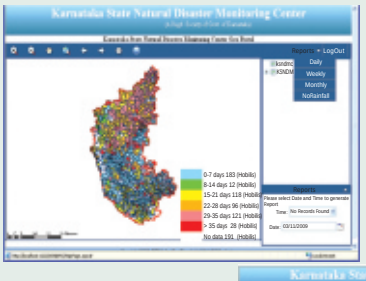
The KSNDMC decided to establish a Disaster Portal – by taking up a major initiative of converting all their data holdings into a real-time geodatabase and analysis systems. With their powerful empirical models, KSNDMC envisages the Portal to be a GIS service that will provide real-time estimates of drought, rainfall, crop status, earthquake monitors and many other parameters. The Portal is a sophisticated project that embeds the geodatabase on a powerful map and imaging server software to be able to model and estimate the disaster and provide alerts thru web, SMS and also in conventional maps/reports.

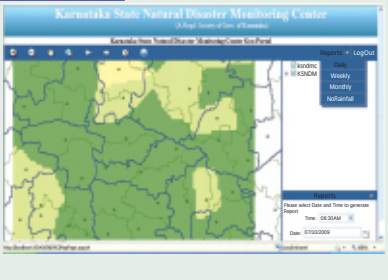
The KSNDMC decided to adopt the ArcGIS Server technology to power their GIS portal for Disaster Monitoring. As the real-time collection, modeling and dissemination of disaster related information is of utmost importance, KSNDMC decided to establish a Web-GIS based Disaster Monitoring portal. The architecture being server–based, will lay the foundation for hosting and serving images and data information. ESRI's globally utilized and accepted ARcGIS Technology was chosen to be at the core of this GIS portal. The ArcGISServer will be used to establish a customized geodatabase ingest method using historical nd real-time networks of automatic weather station data, earthquake seismograph stations data and a host of other base data of disaster. Customised ArcGIS modeling tools will integrate and "crunch" all the data to be able make empirical estimates using the already available KSNDMC models for drought and floods etc. The entire portal is being designed, developed and implemented with help of NIIT GIS Ltd. (ESRI India).

"Disaster Monitoring requires real-time spatial data and integrated non-spatial attributes and powerful tools of spatialisation for modeling. KSNDMC has established simple and empirical models but this needs the power of a good database to be able to be predictive and cut down time of manually analyzing and dissemination of paper maps. Further, the technology has to be able to incorporate real-time measurements from a variety of instruments and observations" says Dr. V.Prakash, Director of the KSNDMC.

"To us this is a challenging project as for the first time GIS is being used to ingest, model and disseminate disaster related data. ArcGISServer technology is most suited for this as it is able to "mash-up" real-time data, images and integrate the models as an "application service" and serve the application (with data) on demand to a variety of platforms – web, hand-helds and also in paper maps. We are committed to make this project a unique bench-mark" said Dr. Mukund Rao, President & COO, ESRI India.

This unique and first-of-its kind GIS Application project using ESRI software technology gives a new hope to GIS users in the world that GIS has a major role to play in Disaster Monitoring and dissemination. ESRI India envisages that this Karnataka project would serve as major reference within all the government agencies especially those who deal with dissemination and use imagery and related data information in the field of disaster management.



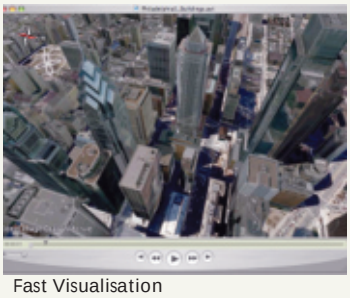


What's Coming in ArcGIS 9.4

ArcGIS 9.4 is a major release of all aspects of ArcGIS and is designed to help you perform your GIS work faster. Some of the highlights include the following:.

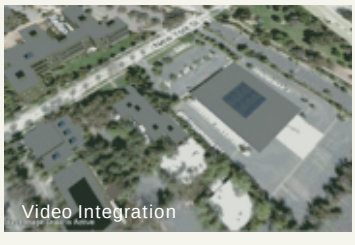
Perform Your ArcGIS Desktop Work More Efficiently

- Faster, more responsive drawing performance including smooth, continuous panning of your data
- Easier access to most commonly used geoprocessing tools
- New Search window in ArcMap to let you quickly locate maps, data, and tools
- Catalog window built into ArcMap for quick data access
- Easier and faster ways to find and use symbols and tools



Fast Visualisation

- Auto hide and dockable windows (e.g., table of contents) so your focus remains on the map
- Ability to execute geoprocessing in the background, allowing you to continue to interact with your map



- Automation of additional workflows with Python (maps and layers)
- Easy-to-use Web APIs and software developer kits (SDKs)
- Single-line simplified geocoding
- Video Integration

Save Time on Map Creation and Production

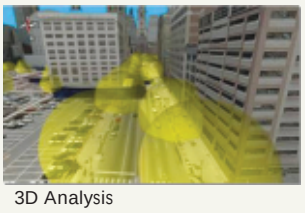
- New geoprocessing tools for multiscale map creation (reduce feature count, complexity, and conflicts)
- Support for layouts with multiple pages for producing map books, including PDFs
- Dynamic layout of text elements (title, date, page number, etc.)
- Map templates for high-quality map generation on the desktop and the Web
- Optimized map service (introduced in 9.3.1) supporting cartographic representations and Maplex labeling authored in ArcMap
- New compact cache format facilitating the creation and management of large map caches
- Enhanced integration of ArcGIS Server with ArcGIS Desktop for map production via geoprocessing services and Python

Manage and Create Data More Easily

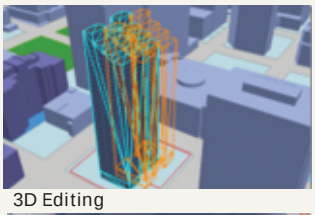
- Open access to the geodatabase
- Integration of a new window in ArcMap to simplify project management and collaboration
- New Query layers that allow you to access all data (including spatial data) stored in relational databases via standard SQL

Access Improved 2D and 3D Editing and Design with Desktop, Mobile and Web Clients

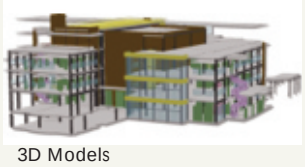
- New sketch-based editing so you can choose from a customizable on-screen palette of features in desktop and Web clients
- Easier access to common editing tools in ArcMap, ArcScene, and ArcGlobe
- Ability to edit the geodatabase over the Web with the new Feature Editing Service
- New customizable ArcGIS Mobile application for mobile and Tablet PC devices



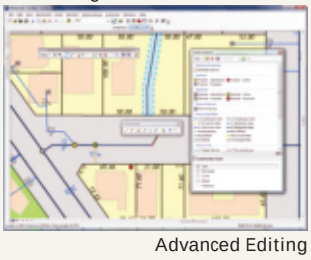
3D Analysis



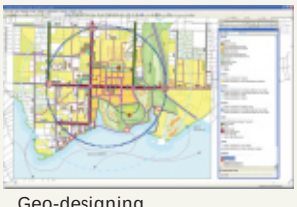
3D Editing



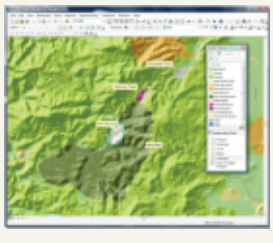
3D Models



Advanced Editing

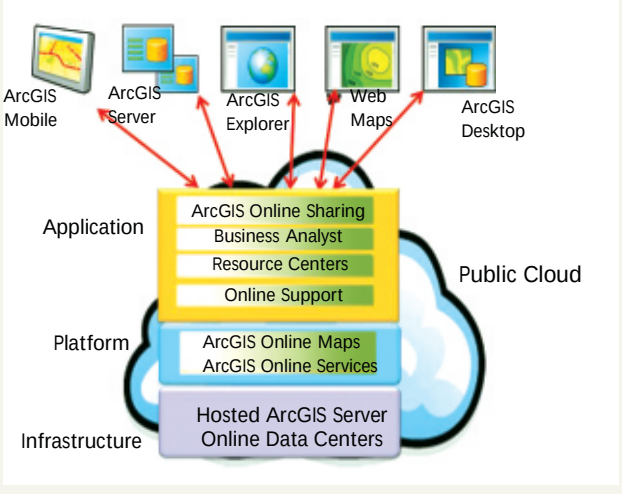


Geo-designing



Experience New Ways to Share

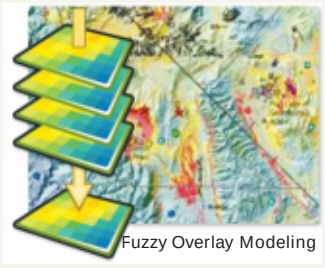
- Tight integration with ArcGIS Online search and sharing application
- Easy to create and distribute projects that may include data, layers, maps, tools, scenes, globes, diagrams, and add-ins
- Easier to share and organize geographic data on the enterprise through the new Search service in ArcGIS Server
- Intiative towards Cloud Delivery Model



Perform Better Analysis and Modeling

- Improved geoprocessing framework
  - ModelBuilder now supporting undo/redo, iterators, and ToolTips
  - Improved map algebra with Python support

- New Fuzzy Overlay and Fuzzy Reclassify tools for better site selection and suitability modeling
- Location/Allocation modeling of network datasets
- New tools for image classification for easier collection and evaluation of training samples
- New ecological sampling design tools accommodating user-defined spatial criteria
- New types of graphs for visualizing analysis results
- New Unicode-aware geocoding engine supporting international languages and more flexible address entry and matching



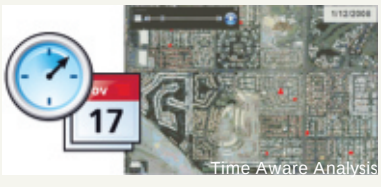
Fuzzy Overlay Modeling

Access Improved 3D GIS Environment

- Improved 3D data management and creation
- New 3D editing tools in ArcScene and ArcGlobe
- Additional 3D analysis and visualization tools
- Included templates and best practices for creating virtual cities

Create, Manage and Visualize Time-Aware Data

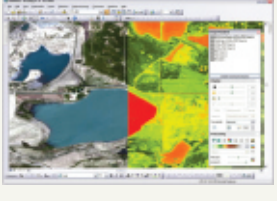
- Creation and management of time-based data
- Can display and animate temporal datasets
- Can publish and query temporal map services



Time Aware Analysis

Find Tighter Integration of Imagery with ArcGIS

- Fast, dynamic raster display
- Web API access to image services
- On-the-fly processing and mosaicking

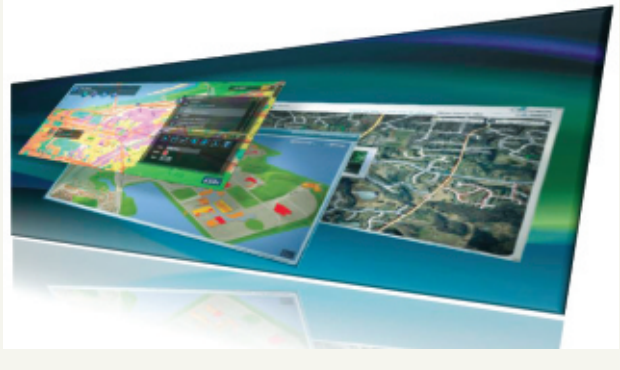


Use Improved Map Services

- New compact cache for easier management of large map caches
- Enhanced optimized map services support for advanced ArcGIS cartography

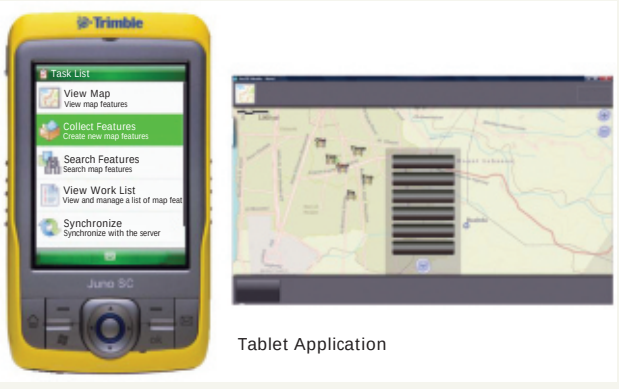
Access Enhanced Configurable Web Mapping Applications

- New, out-of-the-box configurable Web mapping application for ArcGIS Server



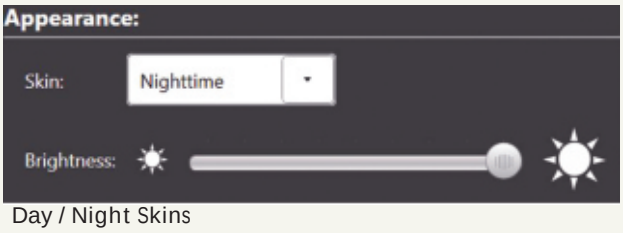
Perform Simplified Mobile Project Management

- New capability to deploy out-of-the-box ArcGIS Mobile projects to in-vehicle and tablet-based PCs
- Enhanced data collection experience with streaming GPS, photo attachments, and location tracking for ArcGIS Mobile applications
- Can quickly configure mobile projects using the new Mobile Project Center to simplify the deployment of projects
- Extended SDK enabling developers to create extensions to ESRI-provided out-of-the-box ArcGIS Mobile applications
- Support for iPhone, Smatphone etc.

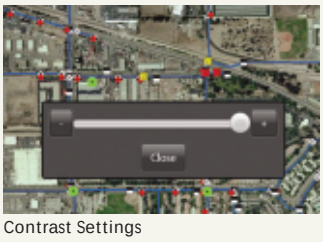


Tablet Application

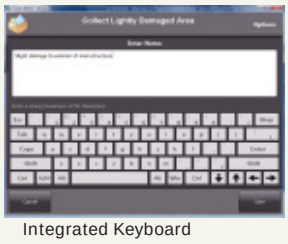
Picture Support



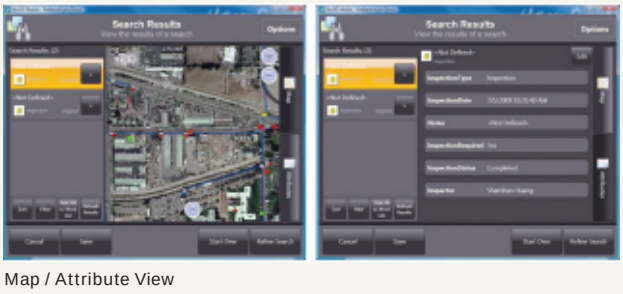
Day / Night Skins



Contrast Settings



Integrated Keyboard



Map / Attribute View

Easily Install and Manage ArcGIS Desktop Licenses

- Ability to check out shared ArcGIS Desktop 9.4 licenses on a different computer (i.e., field units, home machine, or other machine) for temporary use in a controlled environment

Availability

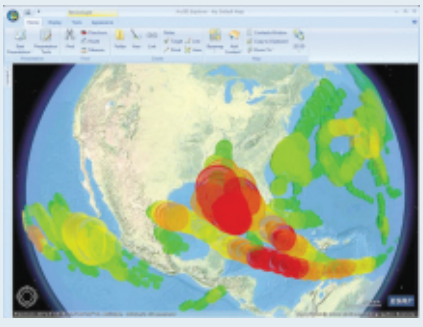
- The ArcGIS 9.4 beta release is expected in the fourth quarter of 2009. ArcGIS 9.4 is expected to be available in the second quarter of 2010.

ArcGIS Explorer

ArcGIS Explorer is a free, downloadable GIS viewer that provides an easy way to explore, visualize, share, and present geographic information. ArcGIS Explorer adds value to any GIS because it helps you deliver your authoritative data to a broad audience.

With ArcGIS Explorer, you can

- Access ready-to-use ArcGIS Online basemaps and layers.
- Fuse your local data with map services to create custom maps.
- Add photos, reports, videos, and other information to your maps.
- Perform spatial analysis (e.g., visibility, modeling, proximity search).



Combine local data with Web services to create custom maps.

Key Features

Access freely available mapping services.

- Access 2D and 3D mapping services from ArcGIS Server; ArcIMS; and Open Geospatial Consortium, Inc. (OGC), WMS.
- Add local data such as geodatabases, shapefiles, KML/KMZ, GPX, and raster formats (JPEG 2000, GeoTIFF, MrSID). You can also add layer packages created using ArcGIS Desktop.
- Connect to ESRI-hosted ArcGIS Online (satellite imagery for the entire world, worldwide streets, terrain, boundaries and labels, political maps, and physiography).
- Answer geographic questions and share the answers with others.
- Perform GIS analysis (such as visibility, direction finding, and proximity search).
- Connect to GeoRSS feeds.
- E-mail your projects directly from the application.
- Customize your map display (symbology, pop-up windows, layer transparency, sun shading, clouds, graticules). You can also use the free, downloadable software development kit (SDK) to create new tools and add-ons.
- Connect to the online Resource Center (http://resources.esri.com/arcgisexplorer/) for a one-stop place to access online help, blogs, and samples, as well as free tasks, layers, and results.

Access freely available mapping services.

What's New in ArcGIS Explorer 900

The latest release of ArcGIS Explorer has many new features that make it ideal for providing wider access to your GIS data and capabilities, and for presenting information in a geographic context. The new features of ArcGIS Explorer include:

New user experience

The new release of ArcGIS Explorer introduces a new user experience featuring a ribbon-based user interface that's intuitive and easy to use. Functionality is presented in the context of what you are doing and the various controls include integrated tool tips.

Basemap gallery

The basemap gallery contains a variety of ready-to-use maps that you can choose from, including ArcGIS Online imagery, transportation, streets, physical, and more. Bing ™ Maps (imagery, hybrid, roads) are found in the gallery. Click to choose a new basemap while maintaining the order and appearance of other layers in your map. Add your own basemaps to the gallery by choosing Save As, then New Basemap.

Integrated 2D/3D display

ArcGIS Explorer now includes an integrated 2D/3D display which can be toggled on-the-fly, providing complete control over your visualization experience. You can choose which mode works best for your data, and save your maps to open in mode one or the other.

Enhanced data support

ArcGIS Explorer supports all of your GIS data and services without conversion. Data support has been enhanced with the following:

- A consistent user experience is presented for all content and access to all supported local data and services has been enhanced.
- ArcGIS Desktop layer files and layer packages (introduced at ArcGIS 9.3.1) are now supported. Layer files and layer packages enable ArcGIS Explorer to leverage ArcGIS Desktop cartography.
- Direct connect to enterprise geodatabases is now supported.

- KML/KMZ support has been improved.
- And more...

Bing™ Maps Services

Microsoft Bing Maps (formerly known as Virtual Earth) services, including aerial imagery, aerials with labels, and streets, are now available to ArcGIS Explorer users. Bing Maps are included in the basemap gallery.

These services are free for ArcGIS Desktop users and available in ArcGIS Explorer for free if using ArcGIS Desktop. For standalone ArcGIS Explorer users these services are available on a subscription basis.

Easy to configure and customize

Application configurations provide an easy way to configure and customize ArcGIS Explorer, and enable you to tailor ArcGIS Explorer for specific users, tasks, or workflows. Configurations are created and managed using the Application Configuration Manager. Application configurations do not require programming, and multiple configurations can be created and centrally managed to support many types of users and workflows.

Presentations

ArcGIS Explorer includes new capabilities that enable you to create dynamic and interactive presentations that include your own maps and data. Add titles and overlays, show popups, toggle layers, and more. Maps can be saved so they open in presentation mode, and you can specify a time interval to automatically advance your slides.

New Developer Experience

The ArcGIS Explorer SDK has been redesigned with Microsoft .NET usability in mind and also to reflect the new capabilities in ArcGIS Explorer. Use the SDK to create new buttons, dockable windows, galleries and extensions for ArcGIS Explorer. Customizations are delivered as Add-Ins, and can also be included in Application Configurations.

ArcGIS Online

ArcGIS Online is an online library of maps, layers, and tools for GIS users. ArcGIS Explorer users can use ArcGIS Online to find and use a variety of resources from ESRI and from other users.

ArcGIS Explorer hosts two groups on ArcGIS Online:

- ArcGIS Explorer – provides selected maps, layers, and add-ins.
- ArcGIS Explorer Labs – unsupported samples, add-ins, and examples from the ArcGIS Explorer team.

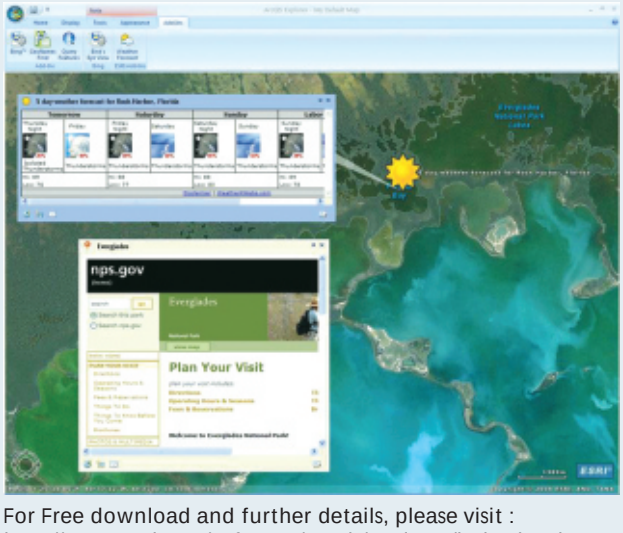
Localization

ArcGIS Explorer is now supported in the following languages: English, German, French, Spanish, Japanese, and Chinese.

Expansion Packs

Expansion packs add new capabilities to the core ArcGIS Explorer, and can be found on the ArcGIS Explorer download page. Expansion packs include:

- ArcGIS Explorer Data Access – provides support for ArcSDE direct connect to multiuser geodatabases.
- ArcGIS Explorer Fonts – adds ESRI fonts for use with ArcGIS Explorer. ESRI fonts are used when displaying ArcGIS layer files and layer packages.
- ArcGIS Explorer Projection Engine – adds more projections and transformations for use within ArcGIS Explorer.



For Free download and further details, please visit :
http://www.esri.com/software/arcgis/explorer/index.html

Letters to editor

ESRI India Publication of Arc India News gives the latest information of Geographical Information System, recent developments, its trend, applications, new concepts, models etc., which gives a valuable framework for the development of our own applications and models. The last issue of Arc India News – India the surge ahead: GIS Stimulus was quite an informative issue of GIS applications.

N.Kavitha
GIS Specialist
TN-IAMWARM Project
MDPU, PWD, Chepauk, Chennai

The articles in the last issue of Arc India News where ESRI Team tried to align the articles with respect to the Flagship schemes of the 100 day action gave an insight how GIS can be used in various disciplines comfortably for the development of a nation. These articles have been quite informative and useful for the future plans of the nation. I heartily congratulate ESRI India Team for bringing out an informative issue and keep up the good work.

Sheetal Shah
Director
SPIN Systems Pvt. Ltd.
Ahmedabad, Gujarat

Geographic Information Systems Modernizing Health Care Services

Introduction

Needs-based medical assistance programs around the world continue to receive attention from policy makers and the public due to escalating costs of medical services, fluctuations in enrollment and utilization, and ongoing concerns about access to care and quality of care. Information technology (IT) promises to deliver to such programs better understanding of access to care, increased efficiencies, improved services, and reductions in fraud and abuse. Geographic information system (GIS) technology is a key component to modernizing the IT of such programs. The role of GIS in modernizing the IT of needs-based medical assistance programs is geographically enabling information systems (with GIS) to support the mission and work of needs-based medical assistance programs.

GIS as A Powerful Tool

Geographic information systems (GIS) consist of a powerful combination of analytic methods and computing technologies that facilitate spatial analysis and visualization of tabular information. Spatial analytic techniques, such as proximity estimations and cluster analysis, are built on statistical methods that incorporate distance and direction measurements to generate spatially accurate maps and graphic reports. Hospitals, health systems, providers, and public health agencies increasingly use GIS as a tool for understanding population health and program planning and generating performance measurements for use as key components of management information systems such as dashboards. Additionally, eHealth initiatives can leverage GIS to achieve disease surveillance and outbreak detection objectives while adding functionality that supports analysis of data from bordering jurisdictions.

More recently, the high level of interest in creating electronic health records has many nations investing in eHealth on a broad scale and, in many cases, across geopolitical boundaries. In addition to the many challenges to find solutions for system interoperability, data interoperability is also involved. One of the most critical challenges of a borderless health record is the ability to share accurate geographic references easily. The desired outcome of this interoperability is to create a standard frame of reference that facilitates decision making and cooperation by promoting the interoperability of geographic information. A Spatial Coordinate is now available to the health community worldwide, along with improved geographic standard Health Level that will help improve the spatial interoperability of health data across all public health authorities as well as between health care providers such as hospitals, clinics, physicians, and emergency responders.

Today spatial data is readily usable within a GIS and refers to data that includes geographic elements, such as latitude and longitude, as well as accuracy information in the form of metadata elements. Representing the GIS community, ESRI, the leading manufacturer of GIS software, began working to assess the ability of the Version 2.x standard to message spatial data to ensure that the Version 3 standard would accommodate data elements consistent with international standards for geographic data representation as well as GIS best practices among hospitals and public health agencies.

Health Geodatabase & GeoCoding

From the GIS perspective, data messaging represents an innovative model for data exchanges—traditionally, the ability to share GIS data depends on the existence of common database models. As a result, many industries that use GIS have worked for years to develop standardized geodatabase models that allow the easy import and export of spatial data. In most market spaces, this strategy has proved effective. Few markets, however, share the internal diversity of health and human services. This may help explain some of the barriers encountered in the creation of a widely accepted health geodatabase model for use as a template within the variety of health market domains served by GIS.

The functional requirements of an information system at a public health department will never match the requirements of hospitals, clinics, and laboratories; database structures that support these areas are equally diverse and geocoded properly. Ensuring the interoperability of spatial data by incorporating spatial content standards into the HL7 Reference Information Model makes spatial data elements available to all HL7 implementers and enables the development of HL7-based GIS services. This is only possible by geocoding where the address information of all the hospitals , clinics and laboratories are converted to spatial data that can be displayed on a map. National health authorities, as well as state and local health departments, have to recognize the importance of geocoding as a foundation for GIS.

Many health departments across the world have developed, or are currently developing, enterprise wide geocoding services. Such services facilitate real-time geocoding of vital events such as births and deaths. An enterprise-wide geocoding service could be leveraged by the Hospital Management Information System (HMIS) as a shared business capability. Health agencies and the systems integrators who have built and maintain HMISs for them should explore enterprise GIS capacities of their sister agencies, as well as what services they may offer to others. Such enterprise GIS capacities could be leveraged on the application layer or the service layer.

Health GIS Case Study – Medicaid

One such examples is in the United States – MEDICAID (A federal entitlement program in the US that provides free or low cost health and long term care coverage to certain categories of low income Americans) and other health care claim processing systems collect and generate large amounts of information that require integration of both administrative and clinical data.

These kinds of data, if geographically enabled, can greatly benefit Medicaid Management Information System (MMIS) when data integration, analysis, and visualization are possible through the use of GIS technology. By associating data with location, proximity to other locations, movements across a locale, and other location-based analyses, MMIS users can make better decisions regarding eligibility, reimbursement, and other health-related services.

Geographically enabled MMIS coupled with appropriate GIS technology provides Medicaid management with enhanced capabilities that may be leveraged across many business processes. To accomplish this requires setting up an interoperable information technology system that involves software, hardware, methods, and labor to conduct all aspects of the Medicaid business processes.

Eventually, the improved MMIS looks for solutions that leverage the massive collection of administrative, clinical, and

operational information for the purpose of addressing the policy and operational issues facing the Medicaid program. Geographically enabled information then becomes a strategic component of MMIS in any administrative decision-making process.

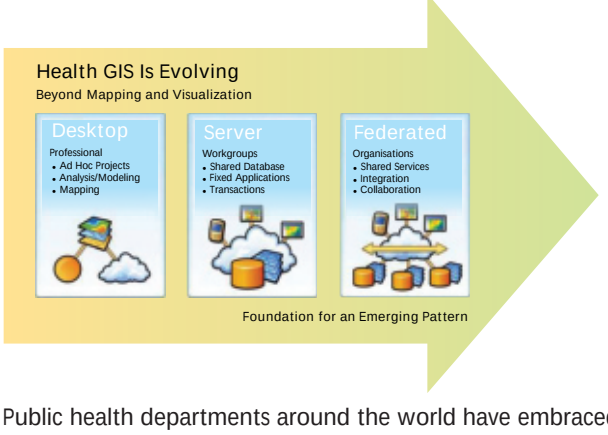
Its implementation requires a multifaceted approach to improving quality of care, reducing cost, and optimizing health outcomes in all health care transactions. ESRI technology provides solutions that create geographic knowledge across the entire Medicaid health delivery and payment system.

The deployments of ESRI desktop, server, and mobile GIS technologies in health and human service agencies, together with geocoding capacities today present many opportunities for shared business capabilities with Medicaid and MMIS under the SOA umbrella

Enterprise GIS

GIS technology has emerged as a powerful tool in many sectors, including health and human services. GIS is not just a stand-alone analytic tool used for health planning or epidemiological research. It may span the entire Health and Human Service (HHS) enterprise, serving multiple divisions, programs, and people from the computer desktop to Web applications to mobile phones and PDAs.

GIS has also been embraced by the IT community and has become a strategic component of information technologies incorporated into the central systems of many enterprises. Figure 1 illustrates the evolution of ESRI GIS in health and human services.



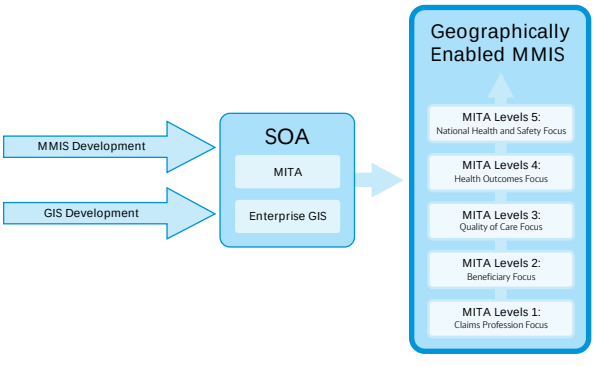
Public health departments around the world have embraced GIS as a tool for collecting and analyzing data, evaluating health programs, and communicating results (internally, to policy makers, and to the public). These departments use GIS on a daily basis to

- analyze the spread of infectious disease;
- promote and encourage healthy behaviors (e.g., targeted marketing);
- protect the public against environmental hazards (e.g., cancer registries, enforcing regulations, plume modeling, targeted notification);
- prevent injuries (e.g., analyzing traffic injuries by location);
- respond to disasters and assist communities in recovery (e.g., situational awareness, identifying vulnerable populations);
- ensure the quality and accessibility of health services, as well as many other programs and services.

Geographically Enabling Health Management Information System (HMIS)

Any Health agencies imparting Health services must be able to integrate with new technologies including advanced spatial data and information delivery. Geographically enabling HMIS would enhance the utility of existing Health data: facilitating decision making and policy development, allowing extensive use of GIS in day-to-day operations (e.g., maps, routing, and advanced spatial analysis), and helping disseminate relevant data to the public through Web-based services locators and population health data query systems. GIS also provides a framework for visualizing and analyzing Health activity near borders and across jurisdictions.

Figure 2 represents the example from MEDICAID - the evolution of HMIS and GIS, as influenced by an SOA approach to IT. The rapid evolution of GIS as an essential component of the IT enterprise for governmental agencies. ESRI has responded to this fundamental shift in the technology landscape by making ArcGIS SOA enabled, with full Web service integration. This allows customers to readily deliver ArcGIS standards-based functionality to other applications and interfaces, thus dramatically improving its value and return on investment (ROI). With SOA-enabled GIS from ESRI, HMIS systems can be assured they can leverage their GIS as they progress from a claims processing focus all the way to a national health and safety focus.



SOA has influenced both MMIS and GIS development over similar time frames. This convergence results in a GIS-enabled MMIS that facilitates progression along the five levels of Medicaid Information Technology Architecture (MITA) maturity.

Health Business Processes and GIS

GIS provides tools and capabilities for performing a wide array of activities associated with geographic and spatial referenced information. Associating data with location optimizes analysis, visualization, and communication of information, thus maximizing the value of Healthcare management. Some of the reasons for incorporating the use of GIS include the following:

Improves organizational performance through significant administrative and programsavings

- Improves quality of geographic data to provide policy and practice decision support
- Supports timely identification of provider and beneficiary fraud
- Reduces undeliverable mail
- Saves time and money spent correcting wrong addresses
- Has point-of-registration address management and geocoding that vastly improves geographic accuracy and decision making

Improves service delivery

- Increases referral compliance for clients through discharge maps and directions
- Determines provider access for more efficient service delivery planning
- Improves call center efficiency utilizing reverse geocoding to identify caller location
- Identifies significant community health problems

Data integration

- Permits integration of a variety of third-party and externally collected data from within the state government as it might be related to fraud and abuse, site location, expected service volumes, utilization management, and surveillance and tracking requirements

Helps Medicaid perform essential specific analyses

- Fraud and abuse detection
- Utilization and expenditures determination
- Enrollment and cancellation
- Provider profiling
- Network access (including access to care performance measures and to focus Medicaid recruitment efforts)
- Trend analysis and detection

Data standards and reporting specifications are also critical in day-to-day operations. Data standardization promotes the employment of commercially available techniques such as bulk mailing, consolidation of mailing, ZIP Code™ presorting, and geocoding. To geographically enable HMIS, all provider and beneficiary data must be exactly geocoded and have the capability to create fictitious addresses to analyze potentially new populations. An effective approach to delivering geographic knowledge within the Health Insurance program begins by implementing a sound address management and geocoding system.

Perhaps the most critical function of an HMIS is its ability to process claims. A typical HMIS should have the capacity to collect and authenticate each address at the time it is collected. Implementing an address management and geocoding system ensures that valid and accurate street addresses are entered into the HMIS. Without such a program, an HMIS can expect about 20 percent of all addresses to be incorrect. This includes addresses of beneficiaries as well as providers. Managing the process by which addresses are collected, authenticated, and entered into a Health Insurance system is essential for the production of accurate geographic information about providers and beneficiaries.

Making sure that addresses are collected and authenticated in a uniform fashion at the point of service (e.g., intake assessment) or at the time a provider seeks program participation requires a system that provides instant access to a set of acceptable addresses. An address management and geocoding system includes a national master address file capable of reporting the likelihood that a given address is valid and sufficiently identifiable to assign a latitude and longitude (i.e., exact geocoding). In addition, the address management and geocoding system can also append additional information to an address that identifies the census tract, block group, or service area in which the address is located. Enterprise geocoding solutions are based on modern industry software development standards and run on all major hardware platforms.

Once the healthcare data is geographically enabled, spatial and statistical analyses are possible. These analyses will be provided to HMIS for management of primary care physician (PCP) and specialist networks as related to enrollment.

Health Information Technology Architecture (HITA)

HITA has a national framework that provides a blueprint consisting of models, guidelines, and principles to be used by states as they implement enterprise solutions. It includes an architecture framework, processes, and planning guidelines that allow Health Care enterprises to meet their health objectives within the HITA framework while supporting unique local needs. These goals include the following:

- Improved health outcomes
- A patient-centric view not constrained by organizational barriers
- Interoperability between health organizations across nation, as well as with other agencies involved in health care
- Web-based access and integration
- Software reusability
- Use of COTS software

Integration of public health data

The HITA framework is composed of three architectures:

- Business architecture includes the operations concept, Maturity Model, Business Process Model, Business Capability Matrix, Self-Assessment, and MITA business services to GIS relevance.
- Technical architecture includes the business services, technical services, technology architecture, Technical Capability Matrix, application architecture, and solution sets.
- Information architecture includes the data management strategy, Logical Data Model, Conceptual Data Model, and data standards.

ESRI GIS and Modernizing HMIS

Many Health Management programs are already using ArcGIS software. Many are using desktop GIS to Server GIS to Enterprise level, assessing beneficiaries geographically enabling HMIS.

ESRI offers a complete range of GIS software and services including software, database design and development, customized applications programming, training, and installation. ESRI GIS software packages, including ArcView, are now the most widely used in the world. ESRI GIS solutions are being applied now in health and human services departments across the world. Many of the 350,000 successful systems that ESRI has implemented are improving the work of health and human service organizations. By adhering to relevant industry standards, ESRI's software packages are able to interoperate seamlessly with other software and are, therefore, ideal for HMIS.

ESRI Interoperability and SOA

ESRI recognizes that data and software capabilities need to be available to a wide range of users in an organization, each of whom may access and use different business tools. The distributed nature of GIS has many implications for interoperability with respect to hardware environments, operating systems, data management, deployment of application logic (desktop, server, mobile, ESB), Web services integration, openly documented application programming interfaces (APIs), and documented XML data schemas. ESRI has addressed interoperability comprehensively by implementing a variety of standards, strategies, and techniques in ArcGIS.

Courtesy: ESRI US Health Team

Combining Immunization Coverage and Population Density Data to Map and Identify Geographical Areas Children Miss Immunization using Immunization Coverage Estimates and Population Density

Introduction: One of the United Nations' (UN) Millennium Development Goals (MDG) is to reduce child mortality. A key strategy to accomplish this MDG is to strengthen routine immunization and implement interventions in geographical areas where large numbers of children miss routine immunizations. Member Countries provide national and sub-national level routine immunization coverage estimates annually to the World Health Organization (WHO), South-East Asia Regional Office (SEARO). In addition, coverage evaluation survey results are submitted when available.

Method – For all Member Countries, SEARO prepares annual maps of routine immunization coverage by sub-national administrative levels (e.g., province, district) to identify low performing areas. In addition, countries provide annual population data by various age groups. To better understand the areas of highest risk, the population density data and immunization coverage data are combined to calculate the number of children who do not receive childhood immunizations. A spot mat is created however, because the population density in some areas in northern India and Bangladesh is so high, one dot may represent 1000 missed children.

GIS technology plays an important role to identify gaps in immunization coverage and children missed from immunization. ArcGIS 9.2 software has been used to prepare immunization coverage and missed children maps. By looking at the maps prepared by GIS software i.e. ArcGIS 9.2, one can easily locate the area where immunization coverage is low and proportion of children missed from routine immunization is very high in South-East Asia (SEA) region. These maps are effectively used by public health stakeholders and/or decision makers for further strengthening routine immunization and to immunize un-immunized children. It will be difficult to determine where to put more efforts and resources, if we only use tables and/or graphs categories by geographical area.

Results – The immunization coverage maps alone do not provide an accurate picture of high risk, under-immunized geographical areas. Areas with good coverage but high population density may represent thousands of missed children (e.g., Bangladesh); conversely, areas of very low immunization coverage when combined with population data may only represent few children who have missed immunization.

Discussion – The minimum WHO global target is 80% of routine immunization coverage by sub-national level. Spot maps of missed children which combine immunization coverage and population density may be more useful to guide decision makers to target scare resources than immunization coverage area maps alone.

Acknowledgements

The authors with to thank the member countries in their continued support and provide sub-national level routine immunization coverage data and population data in SEA Region. The authors also want to thank the EPI Programme managers and data managers in SEA Region.

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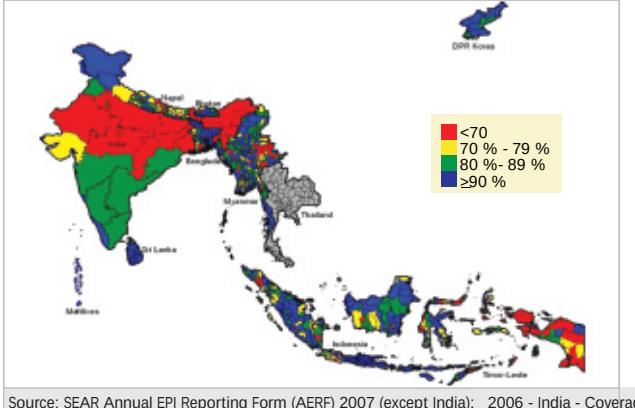
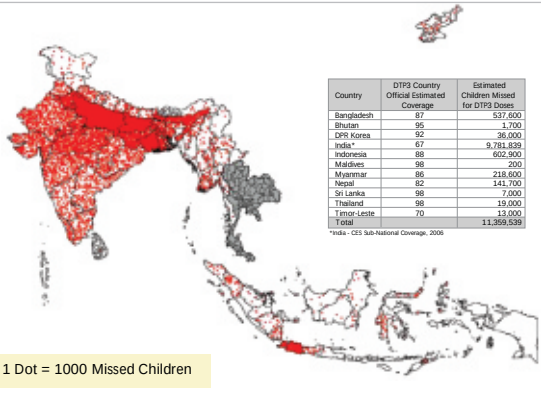
Figure 1: Diphtheria, Tetanus and Pertussis (DTP3) Routine Immunization Coverage, 2007



Source: SEAR Annual EPI Reporting Form (AERF) 2007 (except India); 2006 - India - Coverage Evaluation Survey (CES) Sub-national Coverage, 2006.
No sub-national data submitted from Thailand in 2007. Source of population = Live births from the AERF 2007.

Figure 1: highlights the routine immunization coverage area map of South-East Asia Region (SEAR) for DTP3 vaccine (children who received 3 doses of vaccine per the national immunization schedule). Thailand did not submit sub-natiaonal (province/district) level data for 2007.

Figure 2: Estimated Missed Children Under 1 Year of Age for DTP3, 2007



Country	DTP3 Country Official Estimated Coverage	Estimated Children Missed for DTP3 Doses
Bangladesh	87	537,600
Bhutan	95	1,700
DPR Korea	92	36,000
India*	67	9,781,839
Indonesia	88	602,900
Maldives	98	200
Myanmar	86	218,600
Nepal	82	141,700
Sri Lanka	98	7,000
Thailand	98	19,000
Timor-Leste	70	13,000
Total		11,359,539

*India - CES Sub-National Coverage, 2006

Figure2 : demonstrates how many children did not receive the 3 doses of DTP vaccine (missed children) in SEA Region.

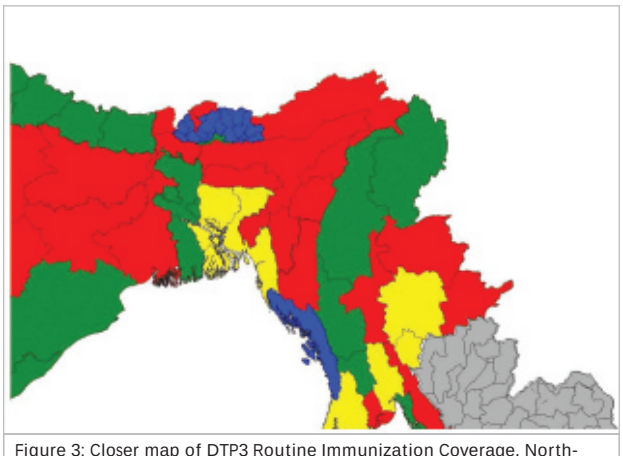


Figure 3: Closer map of DTP3 Routine Immunization Coverage, North-eastern area of India and bordering Bangladesh, 2007

Figure 3 : indicates that
A. Arunachal Pradesh province, India, has very low (<70%) routine immunization coverage of DTP3.
B. Rajshahi division, Bangladesh, has high immunization coverage (>80%). The minimum WHO global target is 80%.

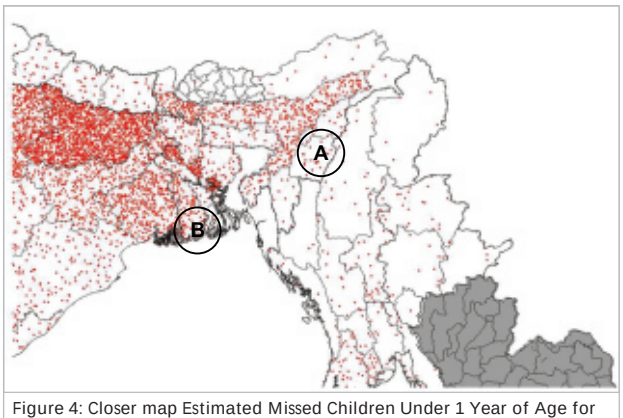


Figure 4: Closer map Estimated Missed Children Under 1 Year of Age for DTP3, North-eastern area of India and bordering Bangladesh, 2007

Figure -4 represents that dot density map of children missed the DTP3 vaccination. While comparing dot density map with area coverage map,
A. Arunachal Pradesh province, India, has very low immunization coverage but very few dots, children who missed the DTP3 vaccination. That province is not densely populated therefore very few children are missed.
B. On the other hand, Rajshahi division, Bangladesh, shows very high coverage but significantly greater number of dots and therefore children who missed the DTP3 vaccination. That area is very densely populated therefore lots of children are missed for DTP vaccination.

The above comparison shows that a coverage map alone does not give you the full picture for evidenced-based decision making. If you see the missed children map, you can easily understand where you need to strengthen the routine immunization services and geographic area to focus scarce resources.

Case Study

Geospatial Kerala Health Information System (GKHIS)

1. Introduction

1.1 Heathcare in Kerala

Kerala is one of the smallest States in the Indian union. Kerala has achieved remarkable progress in human development, as reflected in the high levels of education and health of its population. Health care has a long history in Kerala. Ayurvedic and other forms of traditional medical care were supplemented in Travancore from 1811 by European medicine and the first hospital opened about six years later, it is believed that Portuguese settlers in old Malabar established one of the first hospitals in India.

Kerala has years back experience in organized healthcare and by the time the state was formed in 1956, the foundation for a medical care system accessible to all citizens was already laid. The proof of the same is the existence of some of the hospitals that are more than 50-year-old. Health had been a major area of spending in the budget from early years in Kerala.

With the aim to improve the availability of and access to quality healthcare by people, particularly to those residing in rural areas, the poor, women and children, the Government of India has recently launched the National Rural Health Mission (NRHM). NRHM aims to carry out necessary architectural corrections in the basic healthcare delivery system in the country through adopting a synergistic approach by relating health to the determinants of health like segments of nutrition, sanitation, hygiene and safe drinking water.

In realizing the objectives of NRHM, the role of Geographic Information System (GIS), becomes vital for spatial planning and effective decision making. Efficiency in delivery of health services at various levels especially rural areas can be effectively monitored for identification of gaps and policy making if a "Geospatial Kerala Health Information System (GKHIS)" in a GIS environment is in place. The role of GIS in supporting accidents or eventuality response is depicted by Suresh Francis et al. (2007).

2. Materials and Method

Database Development: The major segments of database development are spatial database generation and non spatial database generation (Fig.1). The spatial database was generated by GPS based field survey especially for the location of Health Institutions and natural resources data interpreted from satellite images and SOI, Toposheet in the GIS environment. The non spatial database was collected from National Rural Health Mission (NRHM), Thiruvananthapuram.

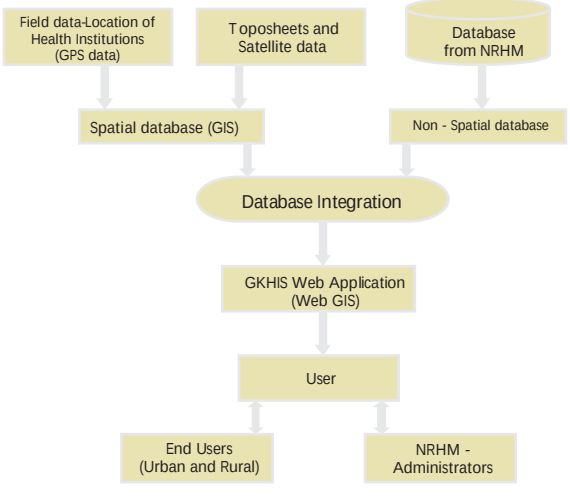


Figure 1: Methodology

Web Application Development: The information system was generated with the 3 tier architecture. The spatial data generated in the GIS environment were brought to the web application with the help of the customised front end generated in the ASP.NET and ArcIMS and nonspatial database developed witht the help of SQL Server 2005 was integrated using Asp.Net Tool to make an interactive system. So, that the user can access and edit the non spatial database and view, query and analyse the spatial database developed.

Information Access: Two types of user access for the system is implemented, one is the general user and the other is NRHM user with administrator role. The general user has restricted access to the database and the administrator has full access to the database and also can update the database.

3. Database

3.1 Non Spatial Database

The database of the Health department where NRHM has a role to play is incorporated in the system either in the form of data entry functionality or/and in the form of data. The detailed major heads under which the database is organised includes Health Institutions: Basic details, Department details, Professional details, Facilities/ Services details. Community Functionaries: Accredited Social Health Activist (ASHA), Auxiliary Nurse Midwife (ANM), Anganwadi Worker (AWW). Health Programmes: Immunization coverage, National Health Programmes, Reproductive and Child Health Programmes,

National Family Welfare Programme, State Health Programme, Water and Sanitation Programme. Disease surveillance: Communicable Diseases, Non Communicable Diseases. Administrative Details: Panchayat Raj Institutions (PRIs), District Administration, Non Government Organizations (NGOs). The 2001 census information for the state is also incorporated panchayat wise.

3.2 SPATIAL DATABASE

The spatial data generated and incorporated includes the GPS survey output of the Government health institutions of Kerala (Fig.2). Health Institutions details like Location (GPS value), Name of Health Institutions, Place name of Health Institutions, Health Institution type like CHC, PHC, BPHC, Main Centres, or Sub Centres, Place of existence like Panchayat, Block Municipalities, Corporation or District are included.

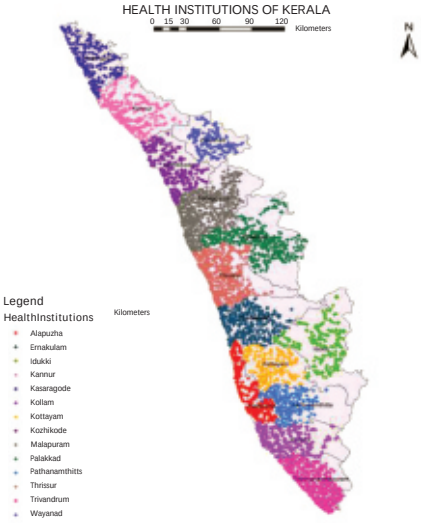


Figure 2

Spatial data development done with the help of IRS LISS III satellite data, SOI Toposheets on 1:50,000 scale, aerial photographs on 1: 10,000 scale and field verification using GIS software's like ArcGIS 9.3 and ERDAS Imagine 8.7 etc. Administrative boundaries upto Panchayat boundary, Road Network, Drainage Network, Place Names, Water bodies, Settlements etc. were the base information available which has got relation to the health standards of the state.

4. Web GIS Application

Since the World Wide Web has became a medium to serve spatial information there have been different methods to deliver a map over the Web. These methods vary from a trivial use of HTML's element to highly complex and sophisticated ones like distributed GIS services in the form of Web mapping and Web GIS knowledge domain.

Web-GIS applications (GKHIS) developed as a support of health care decision-making includes facilities like Health care facilities locations, Emergency service/ response planning, quick data query and browse, data sharing etc. Users, also can access various functionalities like zooming, magnifying, selecting geographic areas, viewing additional neighbouring zones by simple roll over, feature identification and overview map.

The application development was done with the 3 tier architecture system where the front tier or the user interface is developed with the help of ASP.NET and ArcIMS, the logical tier is configured using the ArcIMS services and the database segment was developed using the SQL server 2005.

4.1 User Interface

The user interface (Fig.3) development includes the configuration of service procedures and design procedures like Map service generation, Image server map service generation, Web page Design and coding

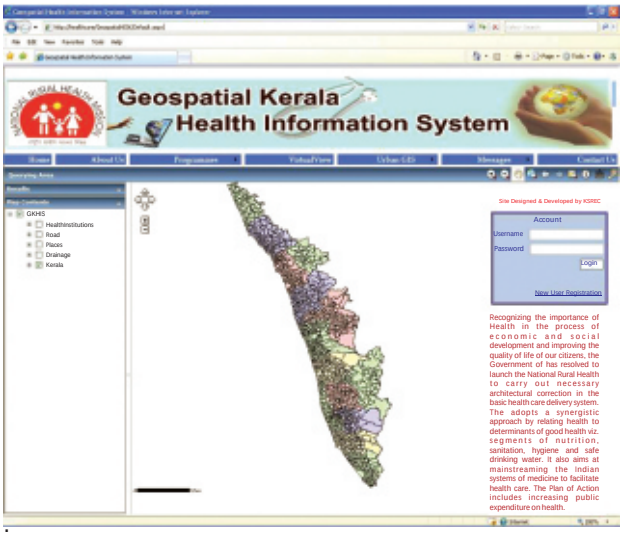


Figure 3: GKHIS User Interface

In map service generation, spatial data layers are prepared and saved as arc map document to generate a desktop map service. The map service generated is then converted into a GKHIS Image Server Arc Map Service using ArcIMS administrator module. The web page design procedure includes designing of banner, menu bar, tools, description area, content window, result window, query window, map display window, login window, database display window, database updating window etc. The Web Map Service or the GKHIS service generated by IMS is interfaced with the present GKHIS application developed using ASP.Net, so that the application can be accessed through web.

The user interface is configured as two separate services where the initial service is with limited facilities where updation of data and viewing restricted data is not facilitated. On the other hand the administrative user has the facility to view and update database. In the case of administrative users with password entry also user roles are fixed by which the accessibility is restricted based on criteria.

4.1.1 Spatial Data Access

Accessibility to the spatial data is provided in the map content area of the user interface as check boxes. Turning on and off the check boxes the spatial data can be activated and deactivated and will be displayed in the map display area. The map navigation facilities are provided in the tool bars of various kinds like zoom, pan, full extent, accessing previous extent, magnifying with various zoom levels, distance measurement, feature identification facility (Fig. 4) and overview of the viewing area during the map navigation, which helps to compare and analyse the data in detail.

The spatial data query facility (Fig.5) helps to query and retrieve information necessary for the decision making process. The query facility provided helps to select any layer in the application and can input simple and multiple queries. The Boolean logic facility helps to provide various combination possibilities in the query building. The query can be dependant on any of the attributes of the layer which can be selected from the dropdown facility. The query can be simple query as well as multiple query. The results of the query will be displayed in the result display area for non spatial data (Fig.6), as well as in the map (Fig.7&8). All the attributes related to the query and also other attributes linked to the query results can be analysed from the non spatial result display area.

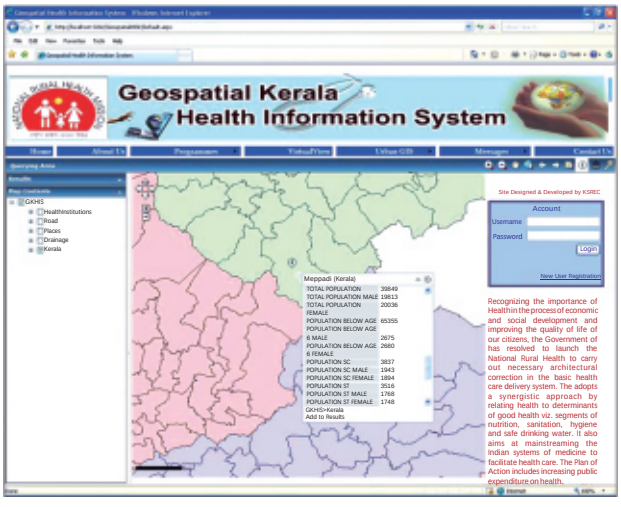


Figure 4: Feature identification facility

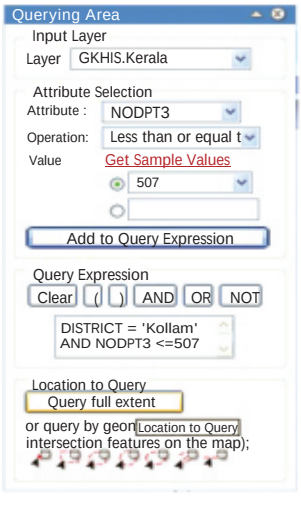


Figure 5: Query Shell

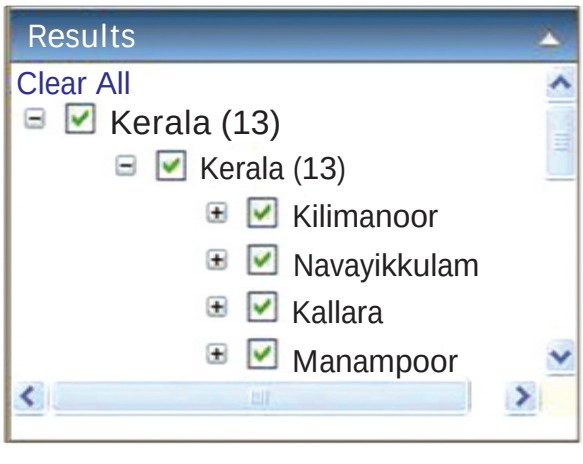


Figure 6: Non spatial query results

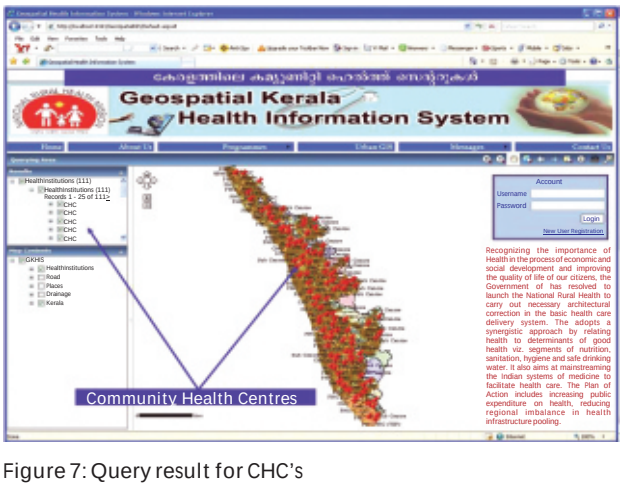


Figure 7: Query result for CHC's

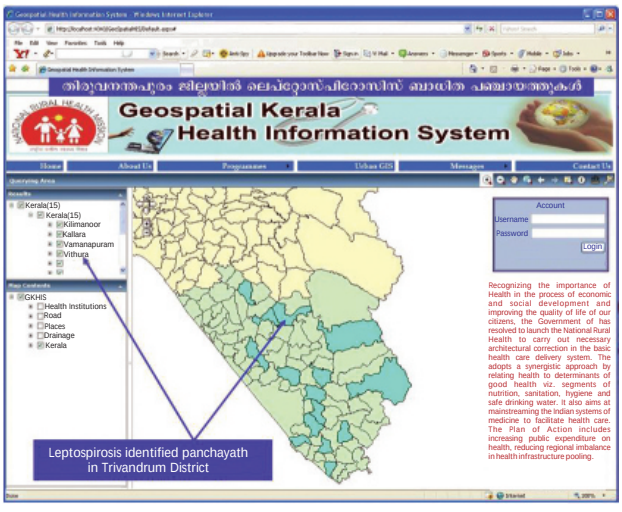


Figure 8: Query result on the spread of Leptospirosis of Thiruvananthapuram District.

4.1.2 Virtual View

The spatial data of the Health Institutions along with the road network of Kerala is interfaced with the Google images with the help of Arc Explorer window the world images (Fig.9), customised and implemented and implemented in the menu segment of GKHIS and helps to view the hospital locations overlaid in the 3D display of the world images, customised and implemented in the menu segment of GKHIS and helps to view the hospital locations overlaid in the 3D display of the world images.

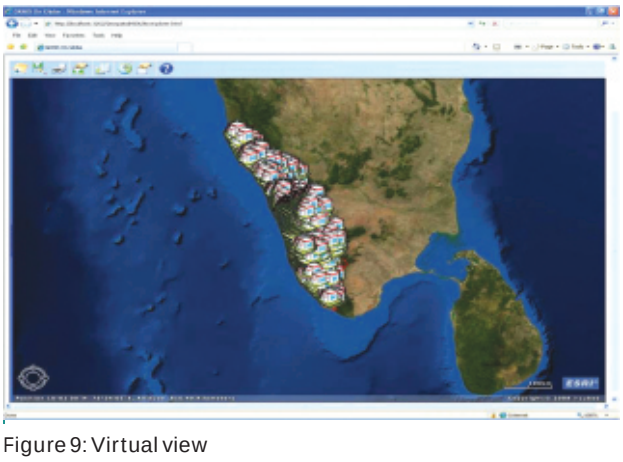


Figure 9: Virtual view

4.1.3 Non spatial Database Access

Non spatial database of the system also have multiple access capability as the services running in the global access and the administrator access are different. The major segments of the non spatial information are accessible for the global user (Fig. 10). Among the major non spatial database segments except for the case of disease data global user has got access. But in the case of administrative user who has got the privilege of the full access to the system gets the edit enabled window for updating the database and also has access to the restricted database of the disease segment and the login window will have the program edit menu function and when activated the entire database details that can be edited will be presented as in the case of figure 11.

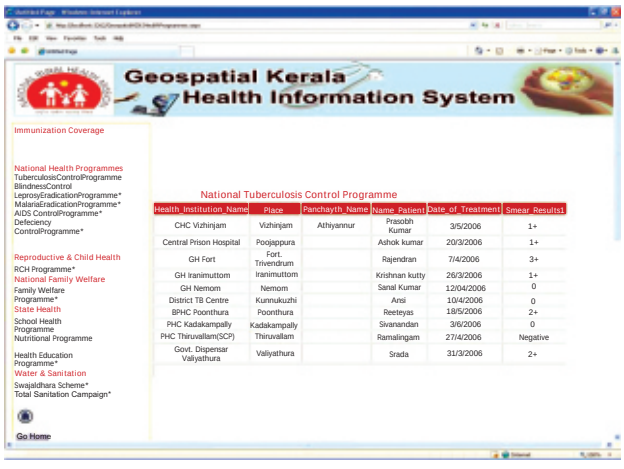


Figure 10: Non spatial data view of National Health Program

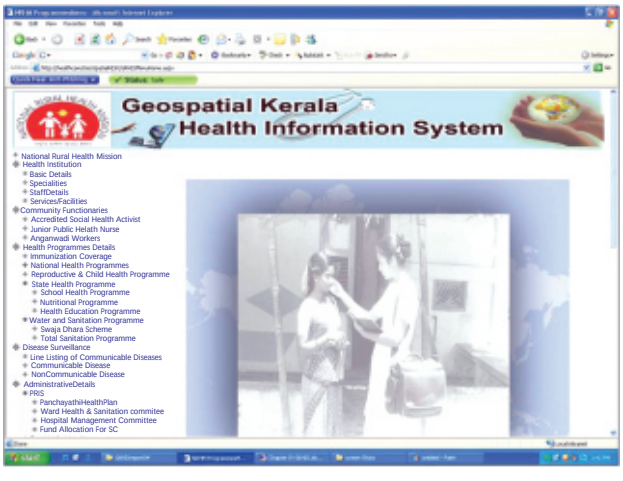


Figure 11: Data edit/update links

The database segments like Health Institution details, Community functionaries, Health Programs, Disease Surveillance, Administrative details, Details of District administration and NGO details with sub menus can be edited/updated with the help of drop down menus, entry options and check boxes (Fig.12). Some of the functions will be activated or deactivated depending on the options selected for the previous functions. In the disease segment which is the restricted data can be entered from the grass root level facilities and thus the decision makers can access the real time information for the visualised day to day decision making. The information on the place of residence of the patient can be incorporated in the case of contagious diseases and the intervention can be initiated as per the spatial information and query results.

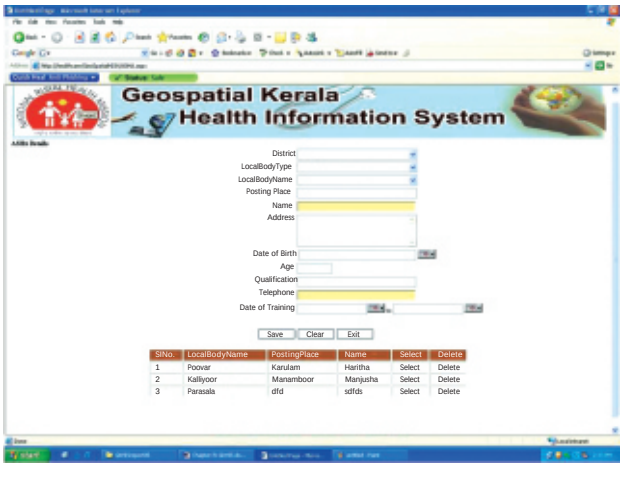


Figure 12: Data edit/update option for basic details

The daily data entry of the diseases reported in the various health institutions can be entered into the system and can have detailed analysis and prediction of the outbreak of any contagious disease and can plan interventions.

4.1.4 Urban Health GIS

The urban Health GIS is the module through which the slum dwellings of the Thiruvananthapuram Corporation area will be mapped and the detailed database will be incorporated, so that the decision makers can have access to the status information of the marginally living population. This module is an extension activity of the system and is under development.

5. Advantages of GKHIS

- The application is an interactive one with facility for spatial and non spatial query
- Facilitate easy collection, storage, updating, retrieval and analysis of data related to public health
- Provide the user with user-friendly icon-driven functions
- Daily, weekly or monthly disease spread analysis reports or maps can be generated for the use of administrators in decision making.
- A user can generate any type of resources (reports) related to Health aspects, on the basis of query submitted, depending upon his accessibility role and can take print out.
- It supports panchayat wise Health Institutions facilities planning, development and management.
- Determining geographic distribution of diseases.
- Mapping population at risk.
- Public accessibility and real time Health status of the State for visualized decision making
- Facilitate monitoring and evaluation of the performance of health institutions, community functionaries, health programmes and epidemiological status for effective decision making
- Provide a user-friendly interface to permit easy update and maintenance of comprehensive data on Health institutions, Community functionaries, Health Programmes, Immunization, Epidemiology & Population data.

References

Suresh Francis, Bindu P. Ramankutty, Sumesh M.S. and Sreeraj M.R., 2007, A life saving info system for Thiruvananthapuram, Geospatial Today, February 2007, pp. 31-33.

Acknowledgement

The authors are thankful to the NRHM for providing financial assistance and support in developing this web GIS application. Further we express the deep sense of gratitude to Director, KSREC for providing the institutional support to carry out the work.

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Interview

with

Mr. Ramesh Ramanathan

Co-Founder Janaagraha, Bangalore

Q. What are the current trends in Urbanisation in India today?

India was 28% urban in 2001, and will be 50% urban by 2030. In absolute numbers, this means that we will see our urban population grow from 280 million to over 600 million in the next 20 years. This kind of mass movement from farm to city has never been seen anywhere in the world before, with the exception of China and even there, it is more controlled.

Q. What are the unique challenges emerging from these new trends?

This tsunami wave of urbanisation creates massive challenges, but we must never forget that urbanisation is an opportunity more than a challenge. People come to cities and cope with all the challenges that any Indian city throws at them because they get some value out of this compromise. This is the opportunity that we need to harness.

The challenges are in multiple directions, but to name a few:

- How do we plan for our cities to provide better quality of life for all residents
- How do we provide the finances for urban infrastructure, which will be enormous, over $1 trillion in the next 20 years
- How do we build capacities in our city governments to address these urban governance challenges
- How do we give a voice for urban citizens to have a formal say in shaping their city – a platform for participation
- How do we make sure that all these funds are not subject to corruption and misuse, and actually get spent for the things they are meant for
- How do we use the tools of modern technology to make urban governance and management easier, more transparent, more cost-efficient

Q. What is the role of Non-Governmental organizations in monitoring the Governance?

As mentioned above, there are massive challenges that we COLLECTIVELY need to overcome, to ensure that we fully harness the urban opportunity. Government cannot do this by itself. They need help from players outside government. This is where non-government actors can play a massive role in urban transformation in India. Some examples are:

- Helping in technical issues like urban planning, urban transportation planning etc. As one example, Swati Ramanathan has started an institution called India Urban Space, which works to highlight the need for better urban planning in our cities. Through this, she works with government agencies at various levels – centre, state and local – to help them translate general fuzzy ideas about planning into reality. She has already worked on helping create a Master Plan for Jaipur. India USP has also worked on workshops on urban planning and eco-planning in many states like Karnataka and Andhra, especially for the smaller towns and cities. Similarly, we have started an initiative with CII called City Connect, which works only on urban traffic and transport issues. Two cities have City Connect chapters – Bangalore and Chennai. City Connect aims to make available technical skills in traffic and transport to government agencies at no cost – transportation planners, traffic engineers etc.
- Helping increase citizen participation in urban governance. There is a massive gap between government and people. NGOs can help bridge this gap by creating platforms that bring these two together, and work on specific issues like garbage, neighbourhood security etc.
- Keeping a watch on government. The tendency to misuse and abuse government funds is very high, and will only grow in our cities, as more funds become available. We need non-government agencies that play the role of watch dogs, to ensure that there is transparency and accountability in the functioning of government. Two means of doing this: using RTI judiciously and probing specific examples of how public funds are used. A second opportunity is by using the Public Disclosure Law that is required under JNNURM, which requires city governments to release their performance records and audited quarterly statements. These need to be debated, and made available widely to the public so that there is greater awareness.

Q. You have been the National Advisor to Government of India for JNNURM project and the project is already in an advanced stage. What have been the benefits vis-à-vis the investments made by the government?

JNNURM has been a game-changer for the urban sector in

India. In the past, nobody in government even acknowledged that India had an urban issue to deal with – the thinking was that all our challenges were in rural India. JNNURM changed that, with a mission that focused on reforms while providing an unpredented amount of funding for urban development.

It is hard to quantify the benefits of JNNURM so quickly, barely a few years after the mission has started. However, it is clear that while JNNURM has been an excellent start, we need to not only improve how the mission functions, but also to add to the work that is needed for the urban sector, beyond the current scope of JNNURM.

Q.As per JNNURM funding requirements, one of the mandatory reforms relates to Property Taxation where GIS based Property Mapping is also one of the qualifying reform component. However, the funding under JNNURM is focused only on Infrastructure development and does not include GIS based Property mapping as a funding component. Do you think the GIS based property mapping should also be funded under JNNURM which would basically enhance the urban revenues by three to five folds?

There are multiple initiatives that cover the area of e-governance, only some of which is being addressed through the JNNURM window. There is also a national mission on e-governance which deals with some of this. I know that there could be other such initiatives, but am not intimately familiar with these. The challenge is to ensure that we get convergence on such initiatives, so that at the level of a city government, they can use these multiple sources of support to deliver solid outcomes.

Q.How can GIS help in strengthening the Government Citizen interface?

GIS is an incredibly powerful platform for urban local bodies, if harnessed properly, and done with sufficient detailing. I am not an expert, but have learnt by working with Swati and others who are passionate about the power of GIS that the areas of GIS-based work are wide-ranging: master-planning that goes from regional level to neighbourhood levels; ensuring compliance with plans; protection of environmentally sensitive assets; developing traffic and transport plans, and tracking traffic corridors; implementing foolproof property-tax /water-supply distribution systems; and so on.

However, the danger is that we treat GIS solutions like we did with computers when they first came out. I remember an IAS friend who used the term "AC by PC" to say that most sarkari set ups used to requisition computers so that they could get air-conditioning installed in their offices! I see that GIS is also running the same risk, becoming more of a buzzword than actually being implemented in a serious, systematic way.

For this, we need to get not only the technical aspects of GIS implementation right, but the institutional architecture within government right: who will be responsible to run urban GIS platforms, who will do procurement, who will generate the data and maintain it on a 24x7 basis, how will various agencies enter into service-level agreements with this GIS agency etc. In our work with the Government of Rajasthan, Swati came up with a creative solution for this, called a Spatial Data Centre, which would be jointly run by the Urban Development Department and the IT Department. The SDC would be mandated with many of the above tasks, and procurement processes were outlined in great detail. This is the kind of approach that we need to take – systematic, step-by-step rather than rushing into this.

Q. What are the different initiatives of Janaagraha in utilization of Geo-Spatial technologies in citizen empowerment?

We have always looked to use GIS-based spatial data for our work from the very beginning. We had a campaign called Ward Vision done several years ago, where maps of each ward, demarcated by neighbourhood were created, and done as pamphlets, so that people could use them on a regular basis.

Our work on realizing the idea of Area Sabhas in urban areas (similar to Gram Sabhas in villages, as required under the Community Participation Law in JNNURM) is also done using GIS.

The recent, very successful Jaagore!One Billion votes campaign also saw the use of GIS, where citizens could enter their address, and a map would show them the location of which constituency they were in, and the location of the nearest polling booth and Electoral office.

We continue to keep innovating in using GIS in all our work, and see this not as an add-on, but an integral part of how we design any of our initiatives.

In all this, one of the institutions that has consistently been supportive of our work has been ESRI, and Rajesh Mathur specifically has been a consistent advisor to help us realize our vision for how to use GIS for urban governance.

Q. We understand you have also initiated a unique exercise on booth level mapping for facilitating rationalized voters list. We would like to have your views on taking this initiative forward to cover large geographies.

As mentioned above, the areas of application for GIS are numerous. One powerful area is in capturing booth-level data for voters. Urban voter lists are very error-prone – we did a study in partnership with the Election Commission of India a few years ago, and the number was a staggering 50% error!

The only way to address this is to use detailed booth-level maps, and attach the voter lists of each booth as attributes to each booth, so that the errors can be corrected, and updation can also be done.

The other advantage of building electoral maps from the booth level is that it then becomes easy to conduct elections and take up work like delimitation etc. Think of the Polling Booth is the smallest atomic unit of our entire political process: a map of India made of 8 lakh polling booths, like pieces of a jigsaw. These pieces fit together in a beautiful way for all kinds of elections: local, state and national. A city ward can be made of 20 booths, an Assembly Constituency made of 200 booths and an Parliament constituency of 2000 booths. This way, we have a nicely nested structure, from the booth all the way to the Parliament constituency, and within the booth, to the individual voter.

This entire system can be developed and managed via a GIS-based platform, and will be the foundation of our democracy.

Tracking Children with Acute Flaccid Paralysis Crossing International Borders

Introduction: In the South-East Asia (SEA) Region, thousands of people cross international borders in search of work, education, tourism or medical treatment. India is among the last four remaining countries with endemic wild poliovirus transmission. Given the close geographical, demographical and cultural associations between India, Nepal and Bangladesh, the risk of spread of disease from India to the polio free countries is very high. Travel between SEA countries has increased due to many other factors including tourism, pilgrimages, commerce, education, employment opportunities, and other political and socioeconomic factors. Therefore, monitoring acute flaccid paralysis (AFP) cases crossing international borders is critical to prevent the importation and spread of wild poliovirus.

Method: The World Health Organization (WHO) SEA Regional Office monitors the occurrence of AFP in eleven member countries. The Regional Office receives notification from the Expanded Programme on Immunization (EPI) focal persons and surveillance officers when an AFP case crosses a territorial boundary. Since 2004, the SEA Regional Office has maintained a database of all AFP cases notified from member countries that have crossed international borders.

To identify the most frequent transit routes of patients, we use Arc-View software to map both the countries of residence and notification. These data are linked and merged with the Regional AFP database to better identify the lowest geographical level possible (e.g., district, Upazila, townships, or blocks) of residence and place where the case was first identified/notified. These are provided to public health decision-makers to support the international health regulations.

Results: Since 2004, 265 AFP cases crossing international borders have been tracked and mapped. The majority (80%) of the cases have been reported between India and Nepal. For all years, the southern districts of Nepal in the terai region and the northern districts in the states of Uttar Pradesh and Bihar India saw the most number of cases crossing territorial boundaries. Eight of the AFP cross-border cases were positive for wild poliovirus (7 between Nepal and India, 1 between Bangladesh and Myanmar. In 2008 (Refer Fig . 4) there is only one case reported between India-Bangladesh and no cases reported between Myanmar-Thailand. It is not clear if the traffic between these countries has slowed or they are not reporting AFP cases to each other that come to their respective countries.

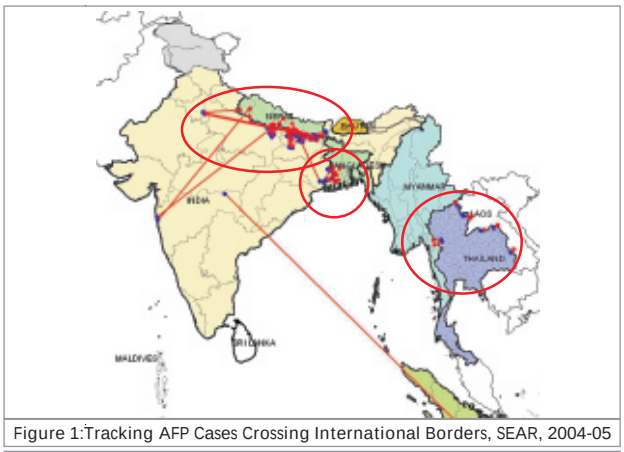

Figure 1:Tracking AFP Cases Crossing International Borders, SEAR, 2004-05

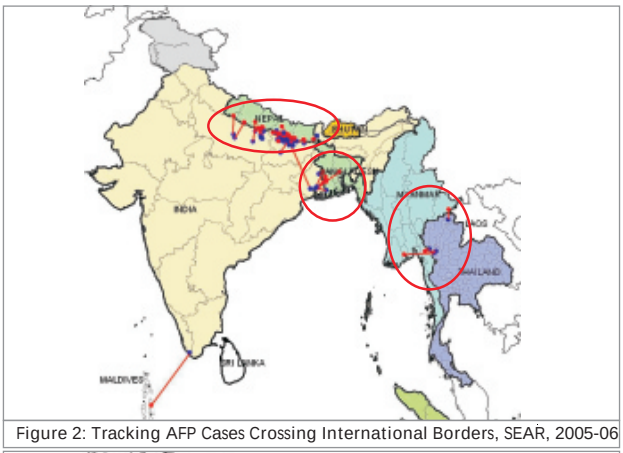

Figure 2: Tracking AFP Cases Crossing International Borders, SEAR, 2005-06

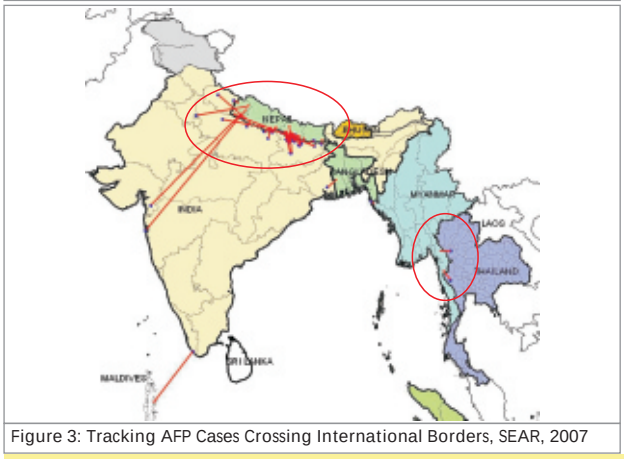

Figure 3: Tracking AFP Cases Crossing International Borders, SEAR, 2007

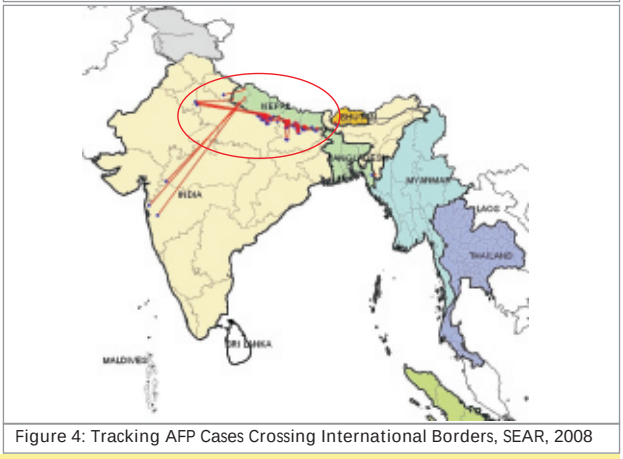

Figure 4: Tracking AFP Cases Crossing International Borders, SEAR, 2008

● Country of case residence ● Country of case investigation ★P1 Wild Poliovirus ★P3 Wild Poliovirus

Discussion:

Mapping the AFP cases helped identify the most vulnerable transit points for wild polio virus transmission. These maps are shared with member country EPI Programmes and other public health decision makers.

This method of tracking and mapping can be used to track other communicable diseases crossing international border. It is also useful to identify and visualize the most vulnerable transit points for spread of disease in support of the International Health Regulations (IHR).

Acknowledgements

The authors wish to thank the SEA Member Countries in their continued support, vigilance to monitor cross border AFP cases and in providing data. The authors also want to thank the EPI Programme managers and data managers in SEA Region.

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GIS into Pandemic Swine Flu Response

Mapping Swine Flu might sound a bit science-fictional for many of us. Most of us may feel that this is not even a relevant website where a large-scale health issue should be mentioned. In order to clarify a few important details we need to believe and go back in time and perhaps explain the very first relation of any infectious outbreak and GIS. Mapping disease networks using digital medical records dramatically change the way we understand diseases in general.

There was a doctor by the name of Dr. John Snow who lived in England in 1850ies. He was the first who stopped a cholera outbreak by marking the location of incidents on a street map of London and where the density of the incidents become higher he had a good look-around. To his surprise Dr. Snow found a well in the middle of incident map and in that very minute he got the local authority there and had the handle of the well-pump removed and suddenly, the outbreak has ended. In short, with basic GIS technique Dr. Snow was able to solve the problem with a map and a pencil and without any computing power. With today's improved medicine and computing power we can deal with this flu-outbreak in no time. One of the major utility is to keep track the geographical spread of contagious pandemics like bird flu, swine flu and cholera. This geographical mapping can be extremely useful in control and management of the diseases. In a recent initiative, India's Health Research Sector has been taking the initiative to produced a GIS-driven digital map of past and predicted outbreak hotspots

"A disease outbreak has been confirmed by the World Health Organization, and now mitigation procedures are initiated. Selected immunizations must be planned, quarantines must be enforced, and progress on containing the outbreak must be communicated to the public. Community leaders need assurance that the data on which they make decisions and present findings to the community are accurate and reflect the real situation and perform both risk assessment and risk information that supports analytic results at a high level of confidence. In addition to system-level interoperability, this situation demands the capacity of different agencies and participants in data exchanges to perform spatial analysis consistent with organizational objectives. Hospitals, clinics, and laboratories would serve public health decision making by capturing geographic data elements as part of their business process, thus enabling immediate import into GIS-based outbreak management systems. Public health authorities could then support response by local assets by making the results of their spatial analyses available in a standardized messaging format.

Responsibilities of Public Health Authorities to mitigate Swine Flu

- To educate and increase awareness on the various stages of a pandemic.
- To familiarize staff with points of distribution, delivery and how a point of distribution center operates.
- Details and practice the city's response plan for pandemic - identification of infected persons, real time reporting of suspected and documented infections.
- Emergency operation center should be connected by all means of communication available to the city would be utilized (conventional radio, cellular, satellite phones, amature radio systems.
- City community emergency Response Team would be engaged to conduct a field assessment, for the deployment of the Strategic National Stockpile of antiviral's Flu.
- Assessment of compiled collected data and used for preparing the medication to be deployed by the Community emergency team.
- Data Collected by the public health authorities should be shared with the citizens inorder to disseminate information of health centres, nearest chemists & pharmacist where medications are available .

Role of GIS in Swine Flu response

Geo spatial Technology provides accurate geographic information and location of infected human, Location of entry ports, airports, hospitals, hospital infrastructure, quarantine stations emergency operation centre, points of contacts of agency in change of outbreak control, distribution point of vaccines and antivirals. This system helped us to visualize location of labs, chemist shop, status of lab, status of resources. We can integrate data of population, environment, services. analysis of infected cases, how many died, sick or well and keep tracking on spread direction,

Real time visual update on a map as to the status of this assessment is readily available from various agencies across the globe for decision making officials at the emergency operation center. Swine Flu maps have been created using ArcGIS technology to track the flu cases over the time and an archive of H1N1 Novel (Swine Flu) ArcGIS shapefiles and Excel spreadsheets are being maintained by Mapcruzin.com. The data includes documentation, fatalities, confirmation and more. The monitoring maps are also available from Healthmap.com and Mapsofindia.com.

Web Application of Pandemic Flu GIS Integration can be created and illustrated how to utilize the attribute data taken to create reports and labels which would aid in deployment of the medication and further action to mitigate pandemic. Report creation can be done utilizing Microsoft Access. Labels can be created for each household member at each address who would receive medication. Through this integration of GIS into Pandemic Influenza response protocol and ability to demonstrate to speed up the response time to constituency while at the same time maintaining social distancing will definitely be an added response monitoring and tracking the pandemic swine flu.

Dr. Mukta Girdhar

Disaster Management Centre , NHQ, Indian Red Cross Society

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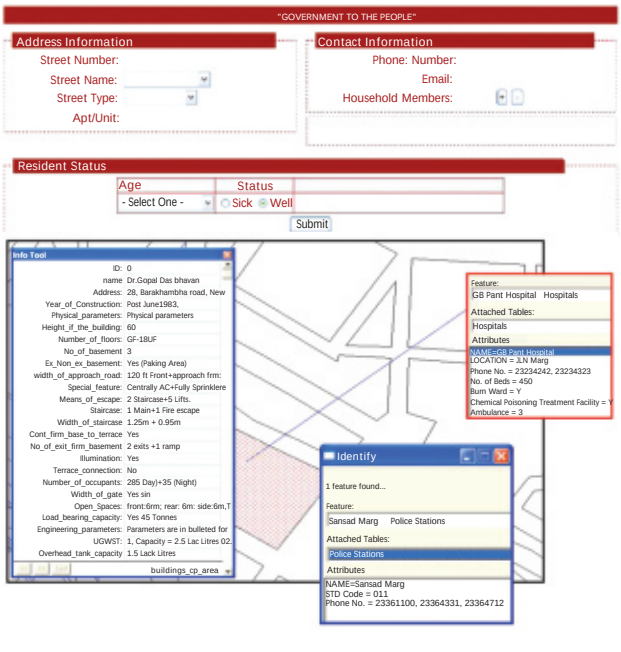
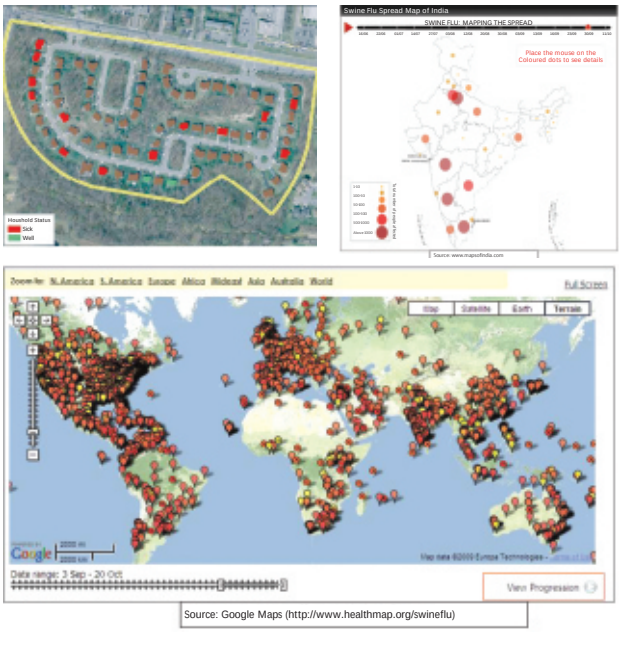
Website : www.indianredcross.org





ESRI International User Conference 2009
A Report GIS: Designing Our Future

The ESRI International User Conference is one of the most looked forward events in any GIS User's annual agenda. This year the 29th edition of the event was held in San Diego, California, USA, from July 13th – 17th at the San Diego Convention Centre (SDCC). Inspite of a global slowdown and numerous corporate limitations on travel and conference participations, around 12000 users attended the event. This year ESRI also completed 40 years of its service to the GIS Community.

Plenary Session

The ESRI International User Conference kicked off with an awe-inspiring Plenary Session where Jack Dangermond, Founder and President of ESRI Inc. gave an insight to the theme of the 2009 ESRI International User Conference "GIS: Designing Our Future". "When I talk of designing our future, I believe that combining the wealth of data available about our world with sophisticated analysis and management tools is the prescription for understanding and shaping the future of our planet—an anthropogenic future where advances in human society, technology, etc., are designed in close collaboration with nature, resulting in the best of possible future worlds. It's a huge task and a delicate balance, for sure, but with help from GIS and GeoDesign tools, we readily accept that challenge" was how he explained his vision.

Keynote presentations were made by Timothy Trainor, Chief Geographer, U.S. Census Bureau, Hernando de Soto, Economist, Author and President of the Institute for Liberty and Democracy (ILD), Peru, and Willie Smits, Biologist, Chairman, Masarang Foundation, and Founder, Borneo Orangutan Survival (BOS).

Industry Specific Sessions

The ESRI UC this year covered diverse topics from Architecture engineering, Business, Defence & Intelligence, Education, Government, Health, Natural Resources, Public Safety, Transportation to Utilities & Communication. Hundreds of GIS professionals shared their work at the 2009 ESRI International User Conference. These presentations comprised a fundamental part of the conference by providing examples of how GIS is used in diverse ways that helped user peers to further develop their own GIS applications.

Map Gallery/ Technical Workshops/User Presentations

A colorful collection of map displays were unveiled during the Map Gallery opening. Technical workshops and User Presentation were conducted showcasing the workflows, best practices, information on specific application sharing and discussions on GIS products with an approach to using ArcGIS software & tools, spanning diverse topics across the world were highlights of these sessions. Concurrent Conferences were also held in conjunction with the ESRI UC – 2009 ESRI Homeland Security Summit, 2009 ESRI Survey & Engineering GIS Summit, 2009 ESRI Education User Conference and Remote Sensing & GIS 2009, to explore the possibilities of geographic learning & spatial thinking and assimilate a valuable resource of networks.

Awards Ceremony

ESRI like every year honors various individuals and organizations for their exceptional use of GIS technology.

- The Enterprise Application Award was awarded to CenterPoint Energy which was received by Cindi Salas, Director, Land & Field Services.
- The ESRI President's Award was presented to Governor Martin O'Malley from the State of Maryland
- The Making a Difference Award was presented to Dr. K.Kasturirangan, Member (Science), Planning Commission, Government of India, for his groundbreaking use of GIS for India's space program.
- The Special Achievement in GIS (SAG) Award to organizations demonstrating vision, leadership, and innovative use of GIS to better serve our global society. Some of the organizations honored at the UC include the Artesia Water Company, Montana State Library, NASA Langley Research Center, Yosemite National Park, City of Madrid, DHL Express, Polytechnic of Namibia, Victoria

Police in Australia, and the Grammar School at Leeds. This year the SAG award from India went to Indian National Centre For Ocean Information Services (INCOIS)

ESRI UC 2009 Showcase & Exhibit Pavilion

The ESRI Showcase, located inside the Exhibit Pavilion, was a comprehensive resource area where users watched demonstrations and got face time with ESRI staff, from product development and professional services to technical support and customer service. The Demo Theaters were an intimate settings where one could get an up-close look at the software in action and talk with the expert presenters and explore the technology further.

The Exhibit Pavilion where more than 300 exhibitors—ESRI business partners and users extending the ESRI GIS platform—were available to answer questions about their advancements and solutions. ESRI India also participated at the Exhibit showcasing its capabilities build around the ESRI Technology.

Closing Session

The ESRI UC ended with wrap up from the whole week conference proceedings followed byan open discussion forum for all the users to ask questions and give feedback to Jack Dangermond and Senior ESRI staff. This year's open discussion forum had a series of questions about the further development on ArcGIS 9.4, GIS future in Local Governments and many more. Answering to the questions by users he and his team said that ArcGIS 9.4 will be an effort to the online environment, specifically posting GIS functionality and building a GIS platform in the cloud. It will have enhancements more to do across the board in the areas of 3D and spatial analysis. On the imagery side it will continue to rapidly pursue innovations and expand our work with our partners. They also informed to serve the ArcGIS 9.4 in a Web 2.0 environment.

India feels proud at the UC

This year the GIS Users in India felt proud at two special awards given to prominent Indians and organizations

Dr. K. Kasturirangan was honored with the Making a Difference Award during the Plenary. ESRI President Jack Dangermond presented the prestigious Award to Dr. K. Kasturirangan, Member (Science), Planning Commission, Government of India, for his groundbreaking use of GIS for India's space program.

Indian National Centre for Ocean Information Sciences (INCOIS) was awarded the International Special Achievement in GIS (SAG) Award. The award was received by Dr. Satyaarayana from Jack Dangermond at the UC.

For more details visit page No - 6 (GIS Community News)

New GIS Image Data Management Capabilities in 9.4

The Image Data Management solution manages large image catalogs. It includes a raster catalog called MOSAIC that lives inside the geodatabase. ESRI also showed how a proposed Image Analyst Workstation would offer enhanced image display and analysis tools for the desktop. An image analysis window offers common tools for image enhancement and analysis. These tools work on conventional imagery and other raster data. The imagery solution has been enhanced with a greater ability to leverage other imagery technology such as ITT VIS and its ENVI suite of software. This adds richness to data management.

Some announcements made at the ESRI UC

Some of the highlights and announcements made by ESRI during the course of the conference was :

- A glimpse of the power of the forthcoming (Q2/Q3 2010) of version 9.4 and outlining the road ahead for this release
- An overview of how the new content sharing application in ArcGIS Online serves as a central repository for users to easily share and find GIS data, maps, layers, services, and tools
- Announced support for the iPhone as a mobile platform to get maps from ArcGIS Server
- Announced launch of MapIt, a software and online services that enables you to create simple maps from your enterprise data, built on the Microsoft platform, enabling organizations to leverage their developers' skills and IT infrastructure using Silverlight, WPF, SharePoint, SQL Server 2008 and Excel
- Announced the GeoMentor program in association with National Geographic to inspire educators and community members to work together to improve student learning.
- Extending information on ESRI's products and activities through Twitter – Geo Twitter

Calkin's Top Nine innovations with upcoming ArcGIS 9. 4

John Calkins outlined the Top Nine innovations with ArcGIS 9.4 desktop on the main stage at the user conference.

9. New user interface with dockable windows that you can hide, with more real estate on your screen, along with a new catalog window embedded in ArcMap that lets you easily add new data layers, including a review of metadata and descriptions.
8. Attribute tables let's you look at selected records, and allows you to arrange the tables any way that you like.
7. New search capability that lets you locate the data that you're interested in, with the capability to add multiple keywords or the search for geoprocessing tools or keywords. Access to both data and analytical tools
6. Reporting capability let's use select the fields that you want, grouping the data, sorting, with new templates that allow you to customize report layout, and save a design for use with other data.
5. New improvements with Model Builder – shows the input, output and parameters for each tool, without having to open each tool. There's also an undo and redo function, and a new background processing function that allows you to continue your work as the process continues in the background.
4. New layers tab is a smart legend that highlights the items on the map as you click them, and hides the layers that no longer appear on the map.
3. Ability to change symbols via a search, rather than browsing all the individual symbols in a long list of more than 20,000 symbols that are included in the software.
2. Easier to create temporal maps with GIS. Complex expressions across multiple fields. Example is a fire history map, with a time layer that allows you to set the date and time for the display. ArcGIS 9.4 is becoming time aware.
1. Fast base maps with the ability to group a set of attributes to create a new basemap layer. The new basemap layer provides a continuous redraw rather than the traditional white space as you pan the map view.

Encrypt/Decrypt Token Values

Environment : Windows Xp

Version : Asp.net 3.5,vb.net 2008

Description : The following code is used for encrypting and decrypting token values.

Author : Rishi Mehrotra

CodeSnippet :

```
Imports System.Security.Cryptography

Imports System.IO

Public provider As New
TripleDESCryptoServiceProvider

//function is used for encrypting token value.

Public Function EncryptToken(ByVal strPassword
As String) As String

'Use DES Crypt oService with Private key pair

Dim key() As Byte = {} ' we are going to pass in
the key portion in our method calls

Dim IV() As Byte = {80, 108, 67, 75, 101,
121, 87, 83} 'this is the same as

Dim SencryptionKey As String =
"i4@c1yj#k2lh!3ed5fxosgwm8a6qb&p7n0r*vt9uz$"

'Dim des As New RC2CryptoServiceProvider()

Dim des As New DESCryptoServiceProvider()

'RC2CryptoServiceProvider rc2 = new
RC2CryptoServiceProvider();

Dim inputByteArray() As Byte

Dim memoryStream As New MemoryStream()

Dim cryptoStream As CryptoStream

Try

key =
System.Text.Encoding.UTF8.GetBytes(Left(SEncr
yptionKey, 8))

' convert our input string to a byte array

inputByteArray =
Encoding.UTF8.GetBytes(strPassword)

'now encrypt the bytearray

cryptoStream = New CryptoStream(memoryStream,
des.CreateEncryptor(key, IV),
CryptoStreamMode.Write)

cryptoStream.Write(inputByteArray, 0,
inputByteArray.Length)

cryptoStream.FlushFinalBlock()

'now return the byte array as a "safe for
XMLDOM" Base64 String

Return
Convert.ToBase64String(memoryStream.ToArray()
)

Catch ex As Exception

dbInteraction.logger.WriteErrorLog(ex,
"Common-EncryptToken",
HttpContext.Current.Session("User_ID"))

Return False

Finally

inputByteArray = Nothing

des = Nothing

memoryStream = Nothing

cryptoStream = Nothing

End Try

End Function

-------------------------------------------

//function is used for Decrypting token value.

Public Function DecryptToken(ByVal encryptText
As String) As String

Dim key() As Byte = {} ' we are going to pass in
the key portion in our method calls

Dim IV() As Byte = {80, 108, 67, 75, 101, 121, 87,
83} 'this is the same as

Dim SEncryptionKey As String =
"abcdefghijklmnopqrstuvwxyz1234567890!@#$*&"

Dim inputByteArray(encryptText.Length) As Byte

Dim des As New DESCryptoServiceProvider()

Dim memoryStream As New MemoryStream()

Dim encoding As System.Text.Encoding

Dim cryptoStream As CryptoStream

'Note: The DES CryptoService only accepts
certain key byte lengths

'We are going to make things easy by insisting on
an 8 byte legal key length

Try

key =
System.Text.Encoding.UTF8.GetBytes(Left(SEncr
yptionKey, 8))

'we have a base 64 encoded string so first must
decode to regular unencoded (encrypted) string

inputByteArray =
Convert.FromBase64String(encryptText)

'now decrypt the regular string cryptoStream
= New CryptoStream(memoryStream,
des.CreateDecryptor(key, IV),
CryptoStreamMode.Write)

cryptoStream.Write(inputByteArray, 0,
inputByteArray.Length)

cryptoStream.FlushFinalBlock()

encoding = System.Text.Encoding.UTF8

Return
encoding.GetString(memoryStream.ToArray())

Catch ex As Exception

'Write error information in ErrorLog.xml file

dbInteraction.logger.WriteErrorLog(ex,
"Common-DecryptToken",
HttpContext.Current.Session("User_ID"))

Return Nothing

Finally

inputByteArray = Nothing

des = Nothing

memoryStream = Nothing

encoding = Nothing

cryptoStream = Nothing

End Try

End Function
```

Customized identify tool


```
Environment : WindowsXp, Sp2

Version     : ArgisServer9.3 with Webadf,
java

Description : This method implements the
customized identify tool and adds the
details in the results tab

Authors     : Anwesh Maity, ESRI India
Consulting

public int identify(MapEvent event) {

            try {

FacesContext ctx =
FacesContext.getCurrentInstance();

Application app = ctx.getApplication();

ExternalContext externalContext =
ctx.getExternalContext();

UIViewRoot view = ctx.getViewRoot();

int id = -1;

WebContext mctx = event.getWebContext();

String LayerName = null;

IdentifyResult ir = getIdentifyResult(mctx);

WebMap webMap = mctx.getWebMap();

WebPoint clickedPoint =(WebPoint)
event.getWebGeometry().toMapGeometry(webMap)
;

IdentifyCriteria criteria = new
IdentifyCriteria(clickedPoint);

WebGeometry extent =
event.getWebGeometry().toMapGeometry(webMap)
;

mctx.getWebQuery().clearGraphics();

mctx.getWebResults().clearAll();

AGSMapFunctionality func =
((AGSMapFunctionality) webMap

.getMapFunctionalities().iterator().next());

mctx.refresh();

MapLayerInfo layerInfos[] =
func.getLayerInfos();   SelectedLayers = new
ArrayList();

//Calling method to fetch layer IDs

SelectedLayers =
getQueryLayersIds1(mctx.getWebQuery(),
mctx);

List resultschk =
mctx.getWebQuery().query(criteria,
SelectedLayers);

if (!resultschk.isEmpty()) {

for (Iterator iter =
resultschk.iterator();iter.hasNext();) {

QueryResult resultidentify = (QueryResult)
iter.next();

WebLayerInfo layer =
resultidentify.getLayer();

layerName =
resultidentify.getLayer().getName().toString
();

id = layer.getId();

break;

}

}

IdentifyCriteria ic = new
IdentifyCriteria(extent, 5);

String str = new Integer(id).toString();

List results =

mctx.getWebQuery().query(ic,getQueryLayersId
s(mctx.getWebQuery(), str));

List selectData = new ArrayList();

if (!results.isEmpty()) {

for (Iterator iter = results.iterator();
iter.hasNext();)

{

QueryResult result = (QueryResult)
iter.next();

WebLayerInfo layerInfo = result.getLayer();

LayerName = layerInfo.getName();

reusultname = result.getName();

result.highlight();

selectData.add(result); }}

mctx.getWebResults().addResultsWithActionArr
ay("Details",

selectData, "getName", "getDetails",

new String[] { "zoom" });

mctx.refresh();

} catch (Exception ex)
{

ex.printStackTrace();

}

return 0;

}

public static List
getQueryLayersIds(WebQuery webQuery, String
layerID) {

List queryLayers =
webQuery.getQueryLayers();

List layers = new ArrayList();

for (Iterator iter = queryLayers.iterator();
iter.hasNext();) {

WebLayerInfo layer = (WebLayerInfo)
iter.next();

if
(layerID.equals(String.valueOf(layer.getId()
))) {

layers.add(layer);

}

}

return layers;

}
```

ArcGIS API for Microsoft Silverlight / WPF – Step by step

Microsoft Silverlight provides a cross-browser, cross-platform development environment for building and delivering rich interactive applications (RIA) for the Web. The ArcGIS API for Microsoft Silverlight/WPF enables you to integrate ArcGIS Server, ESRI MapIt, and Bing Maps services and capabilities in a Silverlight application. You can create interactive and expressive Web applications leveraging ArcGIS Server and Bing Maps resources—such as maps, locators, and geoprocessing models—and Silverlight components—such as grids, treeviews, and charts.

What can you do with the ArcGIS API for Microsoft Silverlight/WPF?

The ArcGIS API for Silverlight/WPF enables you to integrate interactive maps and tasks in your Web applications.

For example, you can:

- Create a map containing your own data.
- Display your data on an ArcGIS Online or a Bing Maps base map.
- Add graphics and markup to a map interactively.
- Search for features or attributes in your GIS data and display the results.
- Execute a GIS model using ArcGIS Server and display the results.
- Locate addresses and display the results.
- Calculate routes and display graphical results and directions.
- Create mashups (information combined from multiple Web sources).

Note: You can program with the ArcGIS API for Silverlight/WPF without installing ArcGIS Server or MapIt on your machine if you have access to an ArcGIS Server or a MapIt via a URL. ESRI offers several sample servers to use when getting familiar with creating Silverlight applications. The samples in this help system use these servers.

What is included in the ArcGIS API for Microsoft Silverlight/WPF?

The ArcGIS API for Silverlight provides the following resources for use in your Silverlight Web applications:

- Maps- Supports multiple map projections, dynamic and cached (tiled) map services from ArcGIS Server, and Bing Map services.
- Graphics- Enables users to draw graphics on a map or create pop-up windows (map tips) when users click or hover the mouse.
- Tasks- Includes components for common GIS tasks:
  - Querying
  - Locating addresses
  - Finding attributes
  - Identifying features
  - Geoprocessing
  - Geometric operations such a buffers, spatial relationships, and simplification
- Access to Silverlight components-The ArcGIS API for Silverlight is built on the Silverlight platform, which allows the use of core Silverlight components such as data grids and panels; and Silverlight Toolkit components such as treeviews and charts. To learn more about the Silverlight platform, visit Silverlight.net or go directly to the developer documentation on MSDN. Optionally, you can download and utilize the Silverlight Toolkit on CodePlex to enhance the look and feel of your Silverlight application.

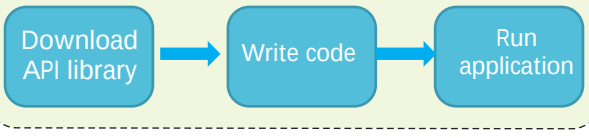
Requirements

For the ArcGIS API for Microsoft Silverlight/WPF, the following items are required:

- At a minimum, install the following set of Microsoft products required to build Silverlight applications:
  - Visual Studio 2008 SP1 or Visual Web Developer Express with SP1
  - Silverlight Tools for Visual Studio 2008 SP1 (add-on)
    - Versions 2 and 3 are supported
- Develop a basic understanding of Microsoft Silverlight and Visual Studio 2008 tools for building Silverlight applications. Use the tutorials and reference materials on Silverlight.net and MSDN to develop your skillset.

Creating an application using the ArcGIS API for Silverlight

To begin working with the ArcGIS API for Silverlight, follow these steps:



ArcGIS Silverlight Assembly	Description
ESRI.ArcGIS.Client.dll	Core library. Contains map, ArcGIS Service layer, graphics, geometry, and symbol components. Also contains common workflow tasks that support query, find, identify, and geospatial and geoprocessing operations.
ESRI.ArcGIS.Client.Bing.dll	Bing services library. Adds support for using Bing layers and services.
ESRI.ArcGIS.Client.Toolkit.dll	Toolkit library. Contains a set of common controls for navigating and interacting with the map, such as a Toolbar, Navigation controls, and a MapTips control. Source available on CodePlex: http://esrisilverlight.codeplex.com

1. Download the ArcGIS API for Microsoft Silverlight/WPF ZIP file. Unzip the content in a directory of your choice. Inside you will find a set of assemblies. The table below lists the assemblies and provides a description of their contents. All assemblies are supported in 32-bit and 64-bit operating environments.
2. Add a reference to one or more of the ArcGIS Silverlight API assemblies in your Silverlight application project. Note, if you are creating a new Silverlight application, choose to "Add a new ASP.NET Web project to the solution to host Silverlight."
   a. In Visual Studio 2008, open Solution Explorer and locate the Silverlight application project.
   b. Right click on the References node and select "Add Reference...".
   c. Activate the Browse tab and navigate to the folder that contains the ArcGIS API for Silverlight assemblies. Select one or more of the assemblies and click OK.
3. In your Silverlight application, open a Silverlight User Control in XAML view (e.g. Page.xaml) and add code to access and display an ArcGIS Server map service.

   For example, the following code shows the items necessary to add and display a map and ArcGIS Server cached map service.

```
<UserControlx:Class="SilverlightApp
.Page"

xmlns="http://schemas.microsoft.com
/winfx/2006/xaml/presentation"

 xmlns:x="http://schemas.microsoft.c
om/winfx/2006/xaml"

xmlns:esri="clrnamespace:ESRI.ArcGI
S.Client;assembly=ESRI.ArcGIS.Clien
t">

<Grid x:Name="LayoutRoot"
Background="White">

 <esri:Map x:Name="MyMap" >

<esri:Map.Layers>

<esri:ArcGISTiledMapServiceLayer
ID="StreetMapLayer"

Url="http://server.arcgisonline.com
/ArcGIS/rest/services/ESRI_StreetMa
p_World_2D/MapServer"/>

</esri:Map.Layers>

</esri:Map>

 </Grid>

</UserControl>
```

4. Compile the code and run your application. Your Silverlight application should be hosted in an html or aspx page on a Web server and accessed in a browser. The Visual Studio's internal Web Development Server will work. If the map is blank, check the following:
   a. Accessing an html page via the file system will not allow remote map services to display within the Map control. By default, files accessed via the file system in a browser have restricted access to remote services which includes ArcGIS Online services.
   b. In order to access an ArcGIS Server site on a different domain than the Silverlight application host site, the ArcGIS Server site must enable remote access to services. This is accomplished using a clientaccesspolicy.xml or crossdomain.xml. In most cases, just place the xml file at the root of your Web site (e.g. for IIS, c:\inetpub\wwwroot\). Note, ArcGIS Online already hosts both files to support cross domain access for all Silverlight clients. See the FAQ topic in this help system for more details.

ArcGIS API for Silverlight – Interactive Samples

http://resources.esri.com/help/9.3/arcgisserver/apis/silverlight/samples/start.htm

Indian Red Cross Society, New Delhi

Recognizing the increasing demands and need for education and training in the field of Geo-Information Science and Technology, in government, planning/ implementation/ monitoring/ evaluation, health and disaster preparedness. The advance techniques like Remote Sensing and Global Positioning System (GPS), if integrated with Geographic Information Systems, can provide authentic and accurate geo spatial information of earth surface features and processes involved, which have become an important IT tool in monitoring disasters and health hazards.

Seeing this growing need The Indian Red Cross Society (IRCS), one of the oldest (1920) institutions in the country had started to impart trainings and various programs related in the field of disasters and health hazards for awareness through various centres like Disaster Management Centre (DMC) New Delhi and Central training Institute (CTI), Bahadurgarh Haryana.

Disaster Management Centre (DMC) started Geo- Informatics Training as a special module of the Post graduate Diploma Course in Disaster Preparedness and Rehabilitation and also offers a separate 2 Week Certificate Program in Geo Informatics Training. The Indian Red Cross Society (IRCS) started these GIS programs in the year 2006. The Programmes is affiliated from Guru Gobind Singh Indraprasth University, Delhi. These GIS Programs are conducted at Disaster Management Centre (DMC) which is situated in the same premises of the Indian Red Cross Society at New Delhi.

These courses aim at an opportunity for different organizations to train their professionals in GIS for effective use in their respective departments. The professionals include like scientists, university students, officers from various government departments (defence services, medicine, judiciary, and national and International relief and development agencies) entrepreneurs, thematic specialist and Businessman's for decision making, Business planning, market analysis and thematic analysis. To provide full benefit of the technology at grass root level.

Faculty

IRCS has specified and dedicated faculty in different discipline of Geo- Informatics and Disaster Management. Besides full time faculty, we also have a several prominent people from the academia, industry and government on our panel who deliver lectures on specialized topics.

Geo-Informatics Laboratory & Infrastructure

IRCS has all the necessary hardware (Desktop Computers/ Servers/ A3 & A0 color Printer) and software (ArcGIS / ERDAS Imagine), lecture hall (24 seat conference room & 6 seat tutorial room) and computer lab to undertake these courses. IRCS also has a very good library with books on various aspects of GIS, GPS and Remote Sensing.

Library

IRCS has a well equipped library with books related to Geographic Information System, Global Positioning System, Remote Sensing and Disaster Preparedness and Rehabilitation Management studies.

Admissions, Eligibility and Selection Procedure

Minimum qualification for admission to this course is a Bachelor Degree in any discipline e.g. BA, BCom, BSc, BE, BTech, BArch etc. awarded by a recognized university of India or abroad.

For more details Contact :

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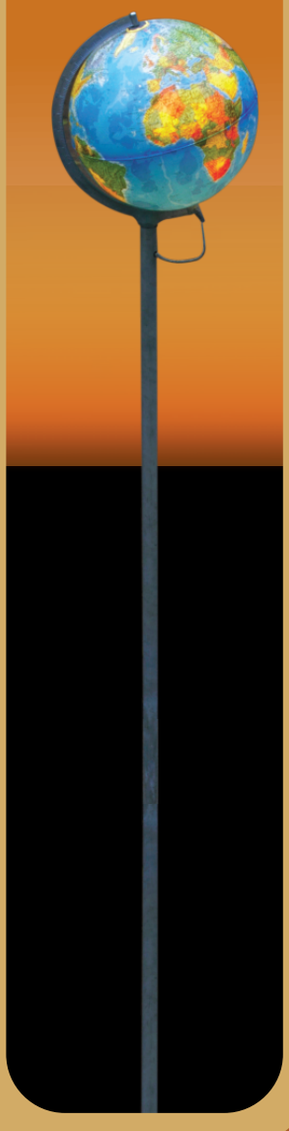
Website : www.indianredcross.org

ESRI

Global Page



Microsoft and ESRI Launch Fusion Core Solution

Provides Integrated Capabilities for Intelligence and Fusion Centers

Microsoft Corp. and ESRI launched Fusion Core Solution, a public safety and homeland security solution architecture. Formerly referred to as FusionX, Fusion Core Solution was designed by the two industry leaders to help public safety and homeland security professionals more effectively prevent today's evolving physical and virtual security threats. In addition, the solution strengthens the ability of government agencies to prepare, assess, and respond to natural disasters.

"Fusion Core Solution fully integrates GIS into public safety and homeland security workflows," said Paul Christin, homeland security specialist, ESRI. "This opens up the benefits of GIS throughout the organization. People can better collaborate and share knowledge for improved threat identification and vulnerability assessments."

The Fusion Core Solution capabilities include

- Managed Intake—Preloaded and fully customizable forms for processing, assigning, and satisfying many different types of intelligence and information service requests
- Enterprise Search—Provides tools to search across multiple data sources including file shares, Web sites, and databases
- Robust Geodatabases—The ability to easily capture, maintain, and disseminate spatial data using the ArcGIS geodatabase
- Integrated Analytics—Powerful search and preconfigured geospatial analysis capabilities that are extendable to integrate new or existing applications

- Analyst Collaboration—Integrated capabilities to enable analyst and customer collaboration using Web sites, wikis, and blogs
- Robust Security—Can be integrated with existing authentication and auditing systems or can provide these capabilities out of the box
- Tools for Managing Operations—Powerful management reporting capabilities for managing analyst staffing and monitoring center activities

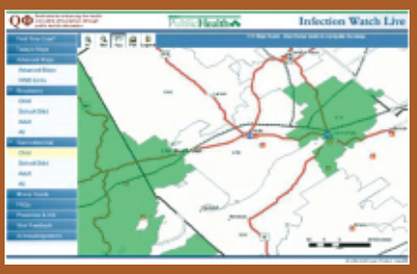
Fusion Core Solution combines the robust capabilities of ESRI's ArcGIS Server Advanced Enterprise and Microsoft Office SharePoint Server 2007. The solution can be implemented by both users of SharePoint and ArcGIS Server as well as new users. Current users of SharePoint and ArcGIS Server will be able to download the Fusion Core Solution Custom Code and build the solution with internal staff or choose to work with a system integrator.

Public sector organizations that used initial components of Fusion Core Solution include the Massachusetts Commonwealth Fusion Center. The agency relies on the combination of SharePoint and ArcGIS for content management, spatial analytics, and information sharing functions that are vital to its law enforcement and counterterrorism mission. For more information about Fusion Core Solution, visit www.microsoft.com/fusion or e-mail fusion@microsoft.com.

ESRI Health GIS Conference : "Improving Our Health with GIS"

Geography is helping organizations and communities across the globe better understand and improve human health. From examining environments to managing projects, geographic information system (GIS) technology is being used to face today's changing world and advance health and human services everywhere. The ESRI Health GIS Conference was organized for Professionals working in public health, hospitals and health systems, human services, managed care, and academic health organizations with an aim to:

- Collaborate with fellow attendees, industry leaders, and ESRI staff.
- Explore important technology for health and human services organizations.
- Take away GIS best practices and real-world implementation ideas.
- Give feedback and receive technical guidance firsthand.
- Play an active role in the ESRI health GIS user community.



The user conference was kicked off with the Keynote address by David C. Goodman, MD, MS . Dr. Goodman discussed how studies of geographic variation reveal serious deficiencies in the cost and delivery of health care. Using historical Medicare spending data, the Dartmouth Atlas Project has identified substantial differences in per capita spending between different regions, while also showing that more medical care is not always better. Dr. Goodman also presented an analysis of "unwarranted geographic variation" that provides remedies for simultaneous improvement in quality and costs. Other Featured Speakers were: Chris McInnish who spoke on GIS Across Health & Human Services: An Integrated Approach and Kim R. Pemble - Impacting Health and Care Regionally: Role of HIE (Health Information Exchanges)

The conference also had some moderated sessions such as ArcLogistics for Health—From Desktop to Dashboard ; Environmental Health ; Geocoding Best Practices; GIS for Hospitals and Health Care Delivery ; GIS for Human Services ; GIS for Workforce Development Health Service Demand Data. This was followed by Technical Workshops on Arc Mobile for GIS Health Mapping and Spatial Statistics.