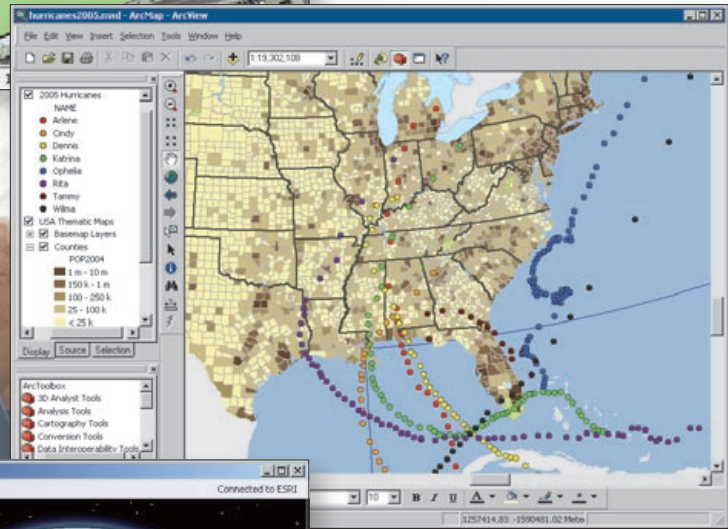
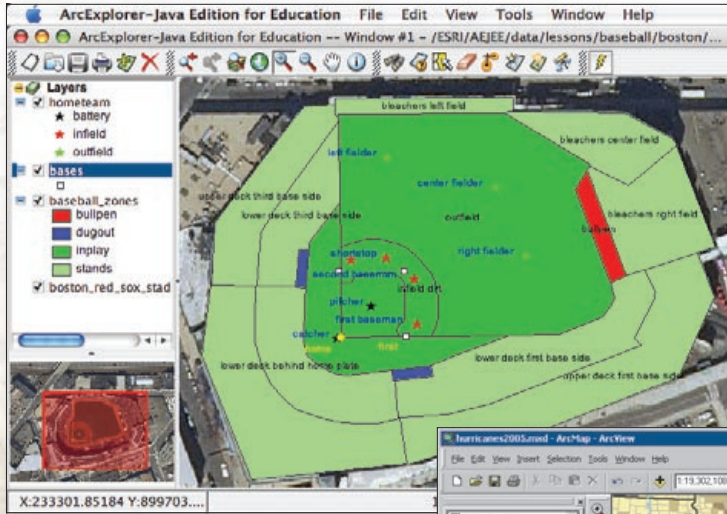


GIS for K-12 Education

Solutions for Students and Teachers



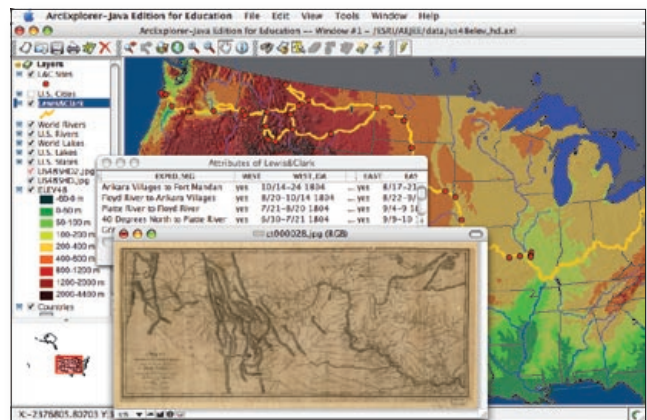
What Is It Like around My Community, My Country, My World?

Every day, in textbooks, newspapers, and TV, students explore their world. They experience their community on foot, by bicycle, by bus, and by car. They collect data by sidewalk and streamside, download videos from the Internet, and gather information from sources far and wide. Managing this great wealth of data calls for a geographic information system (GIS).

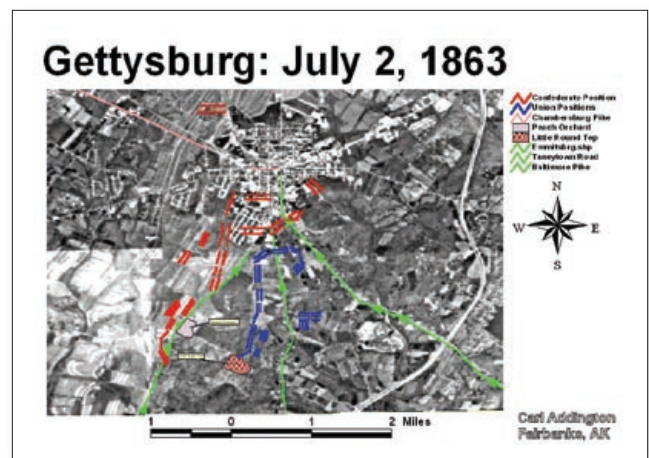
A GIS manages location-based information and provides the tools to display and integrate it, whether it is population characteristics, economic development opportunities, or vegetation types. A GIS consists of more than just computer maps: it gives you the power to link data to maps to create dynamic displays. It provides tools to visualize, query, and analyze data in ways not possible with traditional spreadsheets.

You do not need to teach geography to use GIS. History teachers can watch a region change over time. Science teachers can enhance local projects with interactive maps. Numbers come alive when they represent a real place and can be manipulated in a GIS. Language arts teachers can explore the richness of communication with multimedia GIS. And all classes become vocational in nature when students develop skills sought by the adult world.

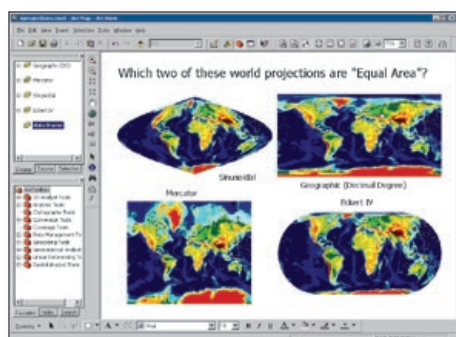
GIS helps students and teachers understand their world. In their schoolwork, students can use GIS to bring value to the community. Everyone benefits when students catalog community resources, help businesses market their products, or define alternative views of the land. Working with businesses, agencies, or researchers, students can use GIS to display the complex fabric that is our community and our world. GIS is a tool for studying the world and all that was, is, or could be in it at a local, regional, or global level.



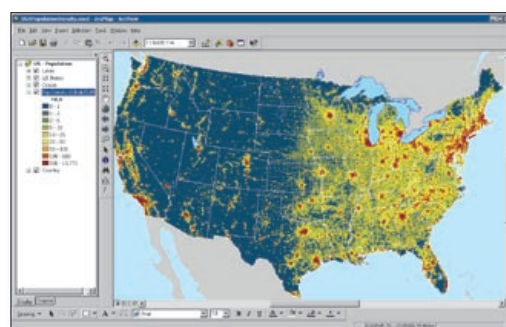
Lewis and Clark Historic Map plus View of Journey Using ArcExplorer™—Java™ Edition for Education (Macintosh®)



Battle of Gettysburg Historic Features Draped onto Modern Aerial Photo Using ArcView® 3



Four World Projections Displayed in One Layout Using ArcView® 9



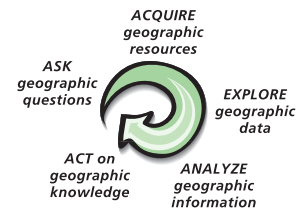
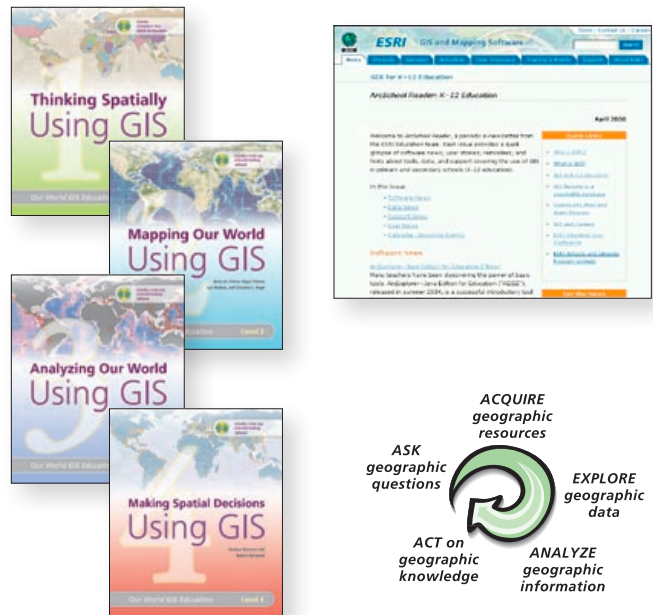
Local Population Density Using ArcView® 9

GIS in Education

There is a world of information to help teach students how to think and analyze information from a spatial perspective. Some of the many options available to facilitate learning about GIS tools and processes include

- Software manuals
- Concept and instruction books from ESRI Press
- Subscriptions to ESRI Technical Support
- *ArcNews™*, *ArcUser™*, *ArcSchool™ Reader*, and *GIS Educator* publications
- Virtual Campus courses on the ESRI® Web site
- Hands-on courses from ESRI or ESRI Authorized Instructors
- Online discussion areas on the ESRI Web site
- ESRI Education User Conference
- Independent e-mail LISTSERVS
- Independent workshops and institutes

Below are selected links from the ESRI Web site that will help you get started and go further with geographic exploration.



Stay up-to-date with these ESRI Web sites:

http://edcommunity.esri.com	→	Education community portal
www.esri.com/schools	→	K–12 education Web site
www.esri.com/arclessons	→	Searchable lesson database
www.esri.com/arcschoolreader	→	Free monthly electronic newsletter
www.esri.com/communityatlas	→	Community mapping project
www.esri.com/educ	→	ESRI Education User Conference
www.esri.com/esripress	→	Books about GIS software and applications
www.esri.com/mapmuseum	→	Example maps from GIS users
http://training.esri.com	→	ESRI Training and Education
www.gis.com/careers	→	GIS career information
www.gis.com	→	General GIS information
www.gisday.com	→	Web site for global public events
www.geographynetwork.com	→	A wealth of GIS data plus online mapping



1812 World Map Displayed with ArcGIS Explorer



ArcLessons™ Web Site (www.esri.com/arclessons)



K–12 Industry Web Site (www.esri.com/schools)

Geographic Data Choices

Spatial data about many subjects is available from public agencies and commercial data providers. ESRI distributes starting data with ArcView® software. Additional data can be downloaded or even used on the fly from the vast repositories on the Internet such as the Geography Network™ (www.geographynetwork.com) or ArcGIS™ Online (<http://arcgisonline.esri.com>).

ArcView also provides tools for creating your own digital map features, building tabular databases, and integrating imagery. Students can create statistical data from sources such as the daily newspaper, annual reports, or their own field research with global positioning system (GPS) units. They can join new information to existing geographic shapes such as countries, state outlines, or GPS points.



The ESRI Data & Maps Page



The ArcGIS Online Starting Page

Software Options and Hardware Requirements

GIS is a resource-intensive technology. It works best on fast processors with significant RAM and sufficient storage space available.

Software	Operating System	System Requirements
ArcView 9 and extensions for Windows®	Windows 2000, XP or higher	PC with 800 MHz or faster processor, 256 MB or more RAM, 1 GB or more disk space, CD-ROM device
ArcGIS® Explorer	Windows 2000, XP or higher	PC with 800 MHz or faster processor, 256 MB or more RAM, 1 GB or more disk space, CD-ROM device
ArcExplorer™—Java™ Edition for Education, Windows version	Windows 2000, XP; JRE 1.4.2	PC with Pentium® or higher processor, 32 MB or more RAM, 25 MB or more disk space
ArcExplorer—Java Edition for Education, Macintosh version	Mac OS 10.2 or higher; JRE 1.4.2	Macintosh G3 or higher processor, 32 MB or more RAM, 25 MB or more disk space
ArcPad®	See www.esri.com/arcpad	CPU chips for Windows CE: ARM, Hitachi® SH3 and SH4, MIPS, x86
ArcGIS Server	See www.esri.com/arcgisserver	
ArcIMS®	See www.esri.com/arcims	

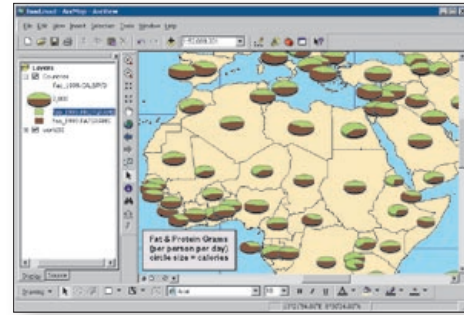
Software Choices

ArcView—Desktop Software for Making Maps and Analyzing Data

ArcView software is a tool for geographic inquiry—asking questions and finding answers through interactive speculation (query building) and visualization (display). As an interactive geographic tool, ArcView allows people to

- Visualize data as maps.
- Design simple to sophisticated what-if scenarios in the form of database and map queries.
- Display the results of queries in the form of maps, charts, and tables.
- Perform basic statistical analysis and spreadsheet functions.
- Join data from outside sources to existing geographic data.
- Create and edit geographic and statistical data.
- Link photos, video, text, and graphics to specific locations for complete multimedia presentations.
- Design and print map, chart, table, and graphic images.
- Export maps, graphs, and tables into other software packages.
- Customize activities and user interfaces.

See www.esri.com/arcview.



Regional Analysis of Daily Caloric Intake Using ArcView 9

ArcView for Schools Bundle

The ArcView for Schools Bundle permits installation of ArcView software and data on computers across a K–12 school campus for instructional use and on teachers' home computers. Included with the software are instructional materials and a rich set of GIS data.

ESRI Data & Maps

Gigabytes of data for the United States and the world. See www.esri.com/data.



Population and Landforms, Using Swipe Capacity of ArcGIS Explorer

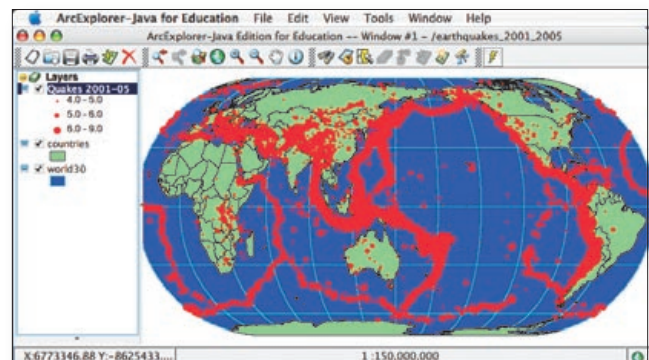
ArcGIS Explorer

ArcGIS Explorer is a lightweight 3D visualization tool that can also run tasks and leverage online data and services to perform analyses. See www.esri.com/arcgisexplorer.

ArcExplorer—Java Edition for Education

ArcExplorer—Java Edition for Education is a lightweight tool that lets students and teachers explore data and create, save, and share projects. Content can be local, regional, or global and even include data directly from the Internet.

See www.esri.com/aejee.



Earthquakes 2001–2005 above 4.0 Using ArcExplorer—Java Edition for Education (Macintosh)

Additional Software Options—ArcGIS Extensions

ArcGIS Spatial Analyst

The ArcGIS Spatial Analyst extension provides a broad range of powerful spatial data modeling and analysis tools seamlessly integrated into the ArcView environment. This extension allows you to create, visualize, and query cell-based raster data and combine vector and raster data for display and analysis. Raster data is well suited to represent continuous data and surfaces. Potential uses of the ArcGIS Spatial Analyst extension include terrain analysis, cost-distance mapping, visibility analysis, or hydrologic modeling.

See www.esri.com/spatialanalyst.

ArcGIS 3D Analyst

ArcGIS 3D Analyst™ allows you to visualize and analyze surface data from multiple viewpoints, query a surface, determine visibility, create a realistic perspective image that drapes raster and vector data over a surface, and record or perform three-dimensional navigation. The ArcGlobe™ application (part of the ArcGIS 3D Analyst extension) allows use of extremely large sets of three-dimensional geographic data and seamless interaction with any data layers on a three-dimensional globe.

See www.esri.com/3danalyst.

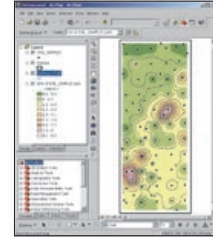
ArcGIS Publisher and ArcReader

ArcGIS Publisher adds easy map publication capabilities to ArcGIS. Use ArcGIS Publisher to create published map files (.pmf) from any ArcMap™ document (.mxd). Published maps can be viewed using any ArcGIS Desktop product including the no-cost ArcReader™ application, allowing you to freely share your maps with a wide range of users. This approach enables GIS users to publish and share data and maps locally, over networks, and on the Internet, allowing multiple users to view and interact with maps simultaneously.

See www.esri.com/publisher and www.esri.com/arcreader.

With ArcGIS Spatial Analyst, you can

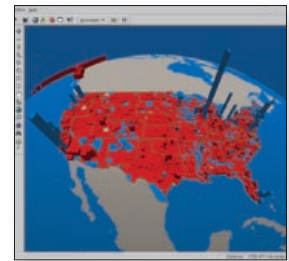
- Produce contour, slope, aspect, and hillshade maps.
- Create continuous surfaces from scattered point features.
- Create buffers based on distance from feature or grid themes.
- Perform cell-based map analysis.
- Query and perform calculations on multiple grid themes simultaneously.
- Convert feature themes to grid themes.
- Import data from standard formats.



Analysis of Soil Samples Using ArcGIS Spatial Analyst

With ArcGIS 3D Analyst, you can

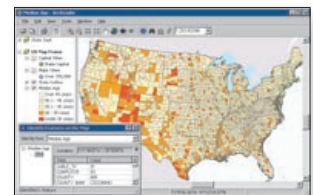
- Create three-dimensional views.
- Analyze three-dimensional data.
- View your data from a global to local perspective.
- Navigate seamlessly through multiresolution terrain data.
- Perform spatial analysis in two or three dimensions.
- Visualize modeling or analysis results in three dimensions.
- Use three-dimensional models and symbols for realism.
- Export your visualizations into videos.



Voting Results from 2004 U.S. Presidential Election Using ArcGIS 3D Analyst

With ArcGIS Publisher, you can

- Easily provide interactive maps to others.
- Protect your maps including cartography and data.
- Provide efficient and controlled access to your GIS data.
- Easily package the required data and maps for distribution.
- Build custom versions of ArcReader for your viewing audience.



Population Density by County Using ArcReader

See additional ArcGIS extensions at www.esri.com/extensions.

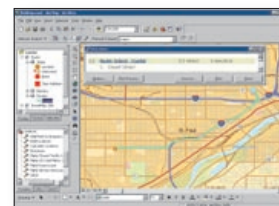
ArcGIS Network Analyst

ArcGIS Network Analyst enables you to solve routing problems such as finding the most efficient travel route, generating travel directions, finding the closest facility, or defining service areas based on travel time. ArcGIS Network Analyst can do point-to-point and multipoint routing and reference local landmarks when reporting route directions. It can use multiple transportation modes and generate expandable inset maps.

See www.esri.com/networkanalyst.

With ArcGIS Network Analyst, you can

- Find the most direct path between two points.
- Find the optimum route between many points.
- Find the closest facility.
- Conduct drive-time analysis.
- Generate driving directions.



Field Trip Routing Using ArcGIS Network Analyst

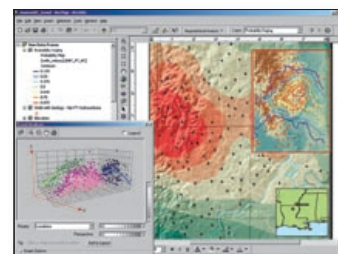
ArcGIS Geostatistical Analyst

ArcGIS Geostatistical Analyst provides a variety of tools for spatial data exploration, identification of data anomalies, optimum prediction, evaluation of prediction uncertainty, and surface creation. It is a complete package for spatial data preprocessing, geostatistical analysis, contouring, and postprocessing. It also includes interactive graphic tools with robust parameters for default models to help newcomers do geostatistical data analysis.

See www.esri.com/geostatisticalanalyst.

With ArcGIS Geostatistical Analyst, you can

- Explore data variability.
- Look for data outliers.
- Examine global trends.
- Investigate spatial autocorrelation.



Probability Model Using ArcGIS Geostatistical Analyst

Additional Software Options

ArcPad

ArcPad provides interactive mapping on a handheld Windows PDA or mobile computer running Windows. ArcPad provides database access, mapping, GIS, and GPS integration to users in the field. Data collection is fast and easy.

See www.esri.com/arcpad.

With ArcPad, you can

- Create maps using your existing vector and raster data.
- Add data from the Internet.
- Pan, zoom, identify, query, locate, measure, and display hyperlinks.
- Create and edit data.
- Connect a GPS and navigate.



Field Data Collection Using ArcPad

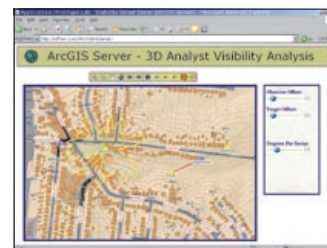
ArcGIS Server

ArcGIS Server is a complete and integrated server-based GIS. It comes with out-of-the-box, end-user applications and services for spatial data management, visualization, and spatial analysis.

See www.esri.com/arcgisserver.

With ArcGIS Server, you can

- Serve maps for display on the Internet or intranet.
- Develop simple to sophisticated mapping Web sites for viewers.



Online Mapping Setup Using ArcGIS Server



ESRI

380 New York Street
Redlands, California
92373-8100 USA

Phone: 909-793-2853
Fax: 909-793-5953
E-mail: info@esri.com

For more than 35 years, ESRI has been helping people make better decisions through management and analysis of geographic information. A full-service GIS company, ESRI offers a framework for implementing GIS technology and business logic in any organization from personal GIS on the desktop to enterprise-wide GIS servers (including the Web) and mobile devices. ESRI GIS solutions are flexible and can be customized to meet the needs of our users.

For More Information

1-800-GIS-XPRT (1-800-447-9778)

www.esri.com

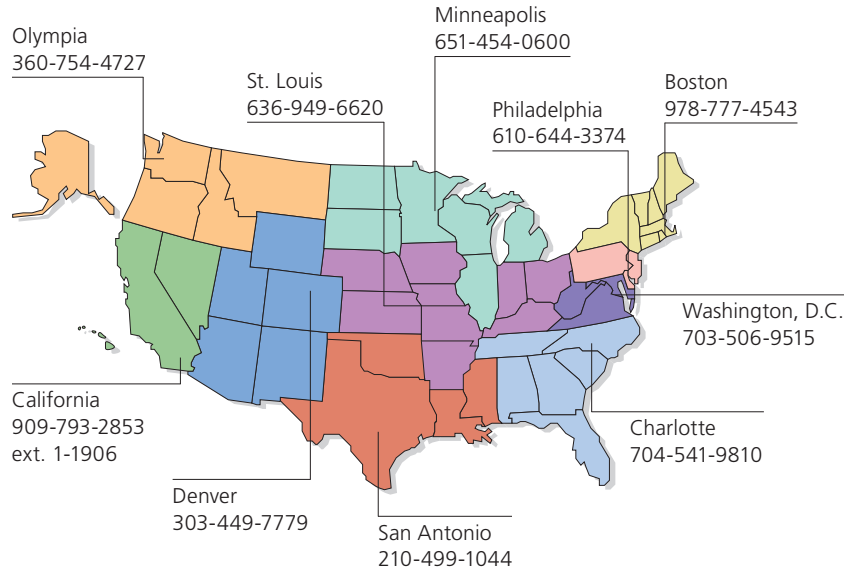
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Thailand
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