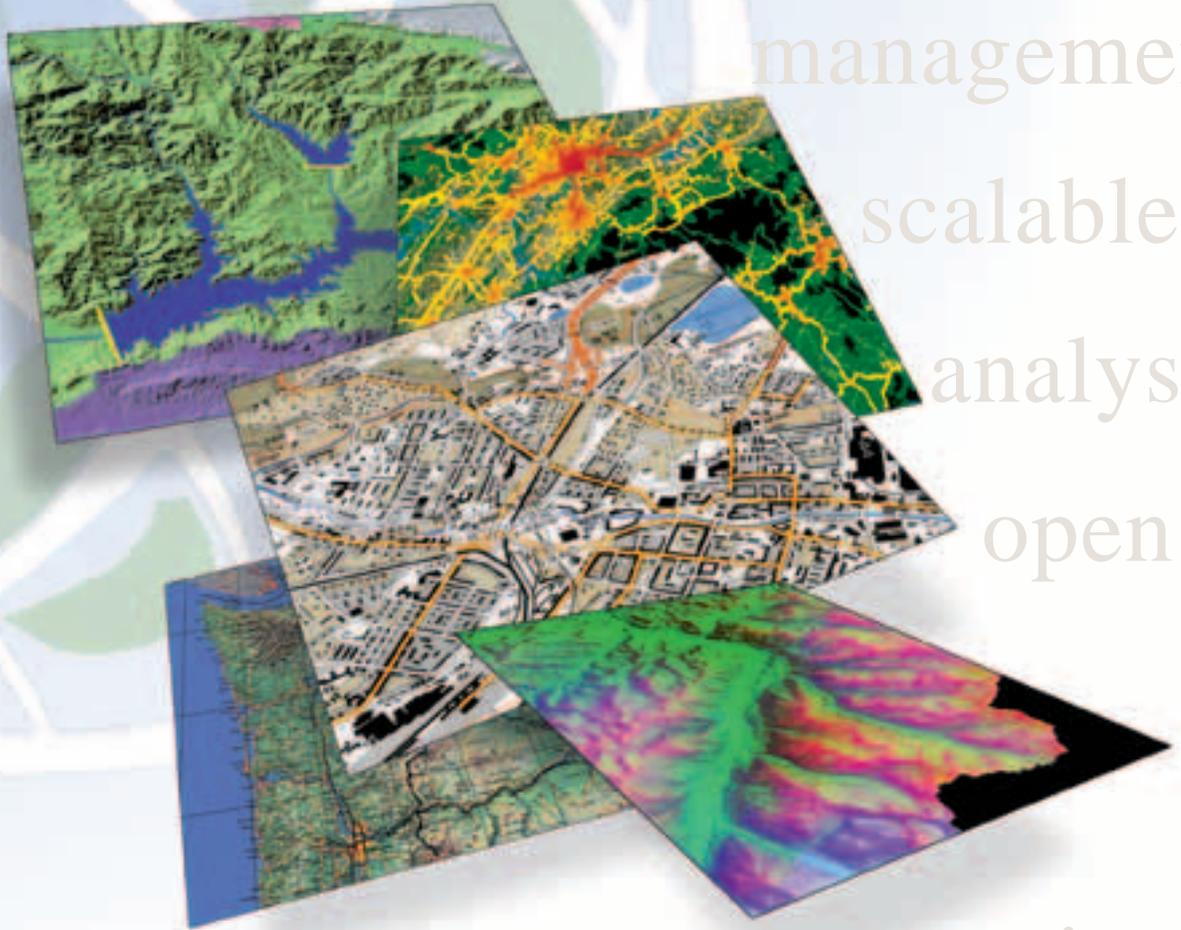development

management

scalable

analysis

open

automation

integration

cartography

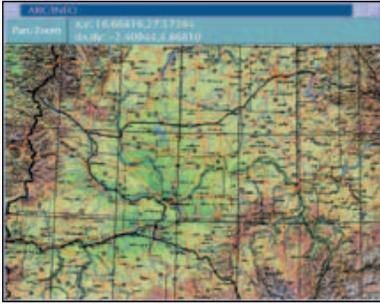# ARC/INFO®

The Professional Geographic Information System™

Welcome to Our World!

ESRI

ARC/INFO from ESRI is the premier geographic information system (GIS) software in use today. If your organization works with information that is in any way tied to a geographic location, you can benefit from using ARC/INFO.

ESRI makes the mapping and geographic information system (GIS) software used by tens of thousands of organizations around the world. ESRI® software integrates databases and maps into useful information for better decision making. Businesses, governments, utilities, and educators worldwide rely on ESRI software to improve operational efficiency, increase profitability, and tap the true potential of their databases.

A Solid Technology for Today and Tomorrow

Born in the late 1960s out of special data processing routines that produced rudimentary character maps, the evolution of advanced geoprocessing tools took hold in the early 1970s. The mass implementation of GIS software grew exponentially in the 1980s, and today it is the integrating technology that enables organizations to bring together many different types of data and databases, for an all-encompassing, unified strategy of spatial data access and management.

The World's GIS of Choice

ARC/INFO® software is the de facto professional GIS in industry, government, and academia. Developed and supported by experienced technical- and applications-oriented staff, ARC/INFO provides state-of-the-art GIS backed by more than twenty-five years of experience in the industry. System acquisition includes extensive hard-copy and on-line documentation, on-site training, and involvement in the largest and most active GIS software user community.

Used by more than 100,000 professionals in more than 40,000 organizations worldwide, ARC/INFO provides the wide selection of GIS functionality and easy access to many data types needed to integrate GIS with a broad array of applications. Corporations use ARC/INFO to route delivery vehicles, plan sales territories, and analyze the competition. Governments at the local, state, and national levels use ARC/INFO to manage land records, track emergency vehicles in real time, and design new parks. And more students are trained to use ARC/INFO than all other GIS software combined at colleges and universities worldwide.

Taking GIS to the Next Level

ARC/INFO integrates graphic or "spatial" data in the form of maps with descriptive or attribute information from an organization's internal databases. ARC/INFO incorporates all the functions found in desktop mapping systems that enable users to integrate vector and raster data, photographs, scanned documents, satellite images, CAD drawings, and multimedia data types for display and query. More important, ARC/INFO takes spatial analysis to the next level by enabling organizations to distribute access across the enterprise, incorporate relational database technologies, implement multiuser systems, perform transaction management, and use higher-level modeling tools that help people transform data into meaningful information.

Data Automation and Integration

• Access a comprehensive set of data entry and editing tools.

• Build vector databases using scanned raster imagery.

• Convert data between more than forty raster and vector formats.
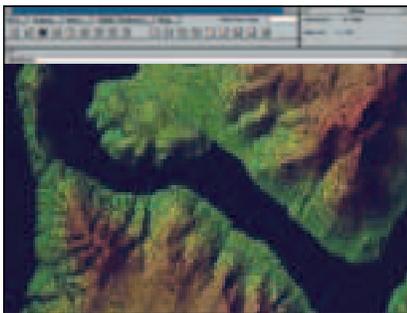
Open Data Management

• Manage vast data sets distributed across multiple platforms and relational database management systems (RDBMs).

• Control multiuser access through transaction management.

• Leverage new developments in object-oriented database designs and multiple data models.

Spatial Analysis

• Perform high-level vector-based topological modeling and simulation.

• Implement complex network and terrain models.

• Perform raster-based modeling with sophisticated map algebra.

Advanced Cartographic Production

• Create powerful interactive map compositions.

• Use superior symbology, color models,fonts, and more.

• Output high-quality cartographic data in a wide array of formats.

Open Development Environment/Object-Oriented Programming

• Increase efficiency by automating routine and repetitive tasks.

• Customize the ARC/INFO user interface with modern development tools.

• Embed ARC/INFO within your application.
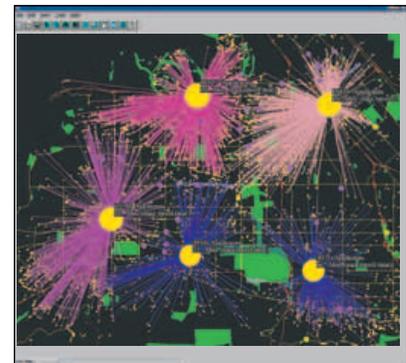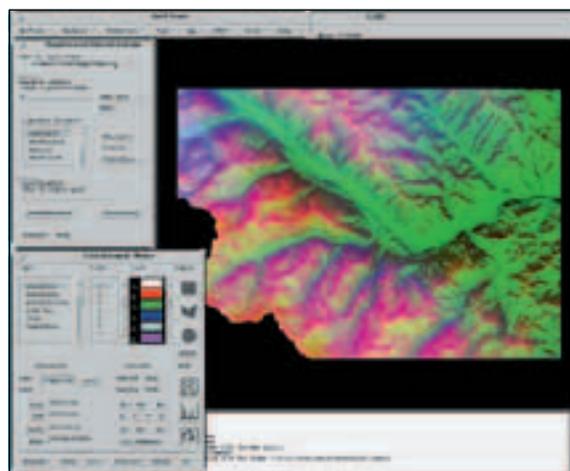
Scalability

• Use ARC/INFO as a stand-alone GIS for project-level work.

• Departments can use ARC/INFO as a workgroup-based GIS.

• Use ARC/INFO as the cornerstone of an enterprisewide GIS.

Scalable ARC/INFO

An Enterprisewide, Client/Server GIS Solution

Using open standards and true client/server architecture, ARC/INFO becomes the GIS server in small or large enterprisewide solutions. GIS data can be accessed, and GIS processes can be implemented across an entire organization. Using interapplication communication (IAC) tools, Windows NT, Macintosh, and UNIX users can execute sophisticated, high-end, and custom geoprocessing operations in ARC/INFO through companion desktop software, ArcView® GIS, ArcCAD®, and MapObjects™ software, bringing GIS analysis to everyone's desktop.

ARC/INFO for Project-Oriented GIS

For project-oriented GIS, build and manage a project database in ARC/INFO workspaces. Perform geoprocessing on the database and produce integrated maps and reports. Whether your project uses a single seat or multiple seats of ARC/INFO, you will make better, well-informed decisions.
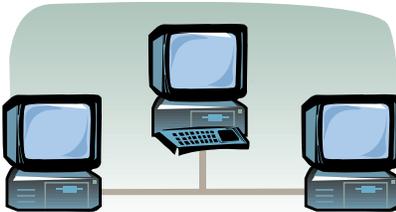
ARC/INFO for Department-Level GIS

Use ARC/INFO for department-level GIS by building and managing a department database and sharing the database with others in your department on a local area network (LAN). Use ARC/INFO for database management and advanced GIS analysis, while you use ArcView GIS for desktop access and operations.
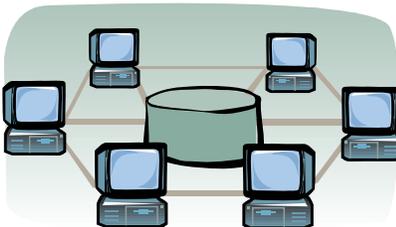
ARC/INFO for Enterprise GIS

Build and manage your enterprise GIS database with ARC/INFO and ArcStorm. Store and manage your spatial database in SDE. Integrate your engineering CAD data. Use ArcView GIS tools for analysis and decision support, or use custom controls like MapObjects software on the Windows NT platform to produce a quick viewing application.
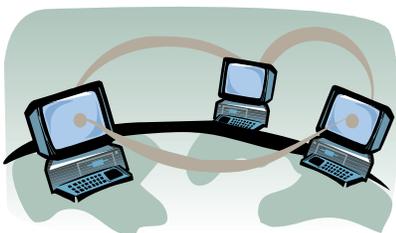
Internet and Intranet GIS

ARC/INFO-based maps and problem solving applications can be served up on intranets (within organizations) and on the Internet (to the outside world). ESRI provides two standards-based open solutions for Internet mapping (MapObjects and ArcView Internet Map Servers). ArcView IMS includes out-of-the-box functionality to deliver maps on the Internet and MapObjects IMS offers customizable tools for building and implementing custom mapping applications on the Web.

No matter what your professional GIS needs are, ARC/INFO opens your organization to a world of information. Tap the true potential of your organization's database with ARC/INFO.

Data Automation and Integration

ARC/INFO Data Entry and Editing Tools

- Tablet digitizing
- Heads-up digitizing
- Scanning data entry (with optional ArcScan extensions)
- Keyboard Entry
- Photogrammetry
- ARC COGO™ total station data recorders
- Global positioning system (GPS)
- RDBMS tools
- Data conversion

Unsurpassed Tools for Spatial Database Automation and Maintenance

The GIS professional is faced with a confusion of data types, formats, and sources. Legacy data need to be converted to current formats, organizational data need to be integrated, and new technologies, such as GPS and automated surveying, need to be exploited. The power of ARC/INFO in integrating disparate data types and giving users access to a single, integrated database is instrumental in successful and timely completion of data automation tasks.

Building true GIS databases is a time-consuming and expensive process best suited for the professional. Better tools save time and money. ARC/INFO supports data entry and spatial data automation with a variety of methods based on your particular situation. And once your database is built, ongoing maintenance with ARC/INFO transaction management capabilities protects data integrity.

Data Conversion

ARC/INFO accepts data in more than forty industry-standard and government-supported data formats.
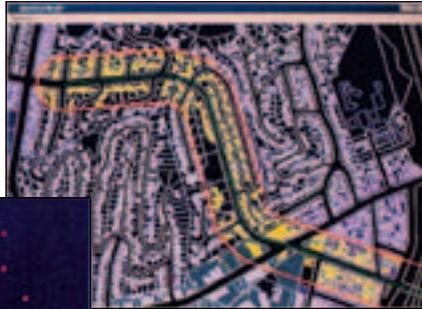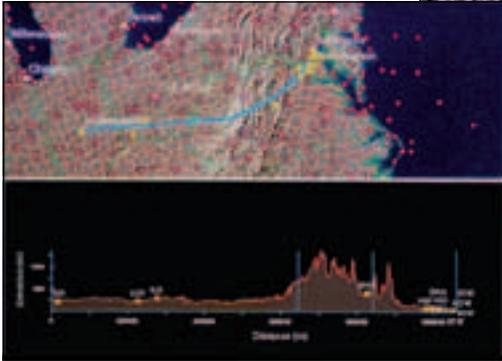
Scanning Data Entry Support

ARC/INFO software's optional ArcScan™ extension allows professional GIS users to build vector databases using scanned raster imagery as input. ArcScan includes tools for raster preprocessing, database construction, and integrated raster–vector conversion and editing.

Prepackaged Data: A World of Information Is Available

Getting started with GIS analysis is made easy with commercially available data. Authorized ArcData℠ Publishers offer a range of demographic, financial, census, street address, environmental, health, ZIP Code, and many other types of data by various levels of geography (state, county, standard metropolitan statistical area (SMSA), census tract, census block group, etc.). ARC/INFO users can combine this "off-the-shelf" data with their existing project or work group databases to further extend their analytical capabilities.

Open Data Management

Spatial Database Engine (SDE)

ESRI's SDE is a high-performance, object-based spatial data access engine implemented in commercial RDBMSs such as Oracle, INFORMIX, SYBASE, SQL Server and DB2 using open standards and true client/server architecture. SDE, the fastest spatial technology on the market today, achieves subsecond feature retrieval time for complex and spatial queries. Minimal performance degradation occurs as tens or hundreds of clients are added.

SDE allows access to spatial data across local and wide area networks. By using TCP/IP protocol and eXternal Data Representation (XDR), you have fast access and retrieval of data across networks including UNIX, Windows 3.1, Windows NT, and Windows 95 systems.

ARC/INFO can be set up as an SDE client, permitting developers to choose among C, C++, or rapid application development (RAD) tools like Visual Basic for interface programming. SDE also allows for integration with other information technology products used in mapping applications.

Powerful Tools for Managing Project, Departmental, and Enterprise GIS Databases

New technology will provide a single point of entry for all ESRI software to access ARC/INFO data in various settings.

- Traditional coverages
- ARC/INFO LIBRARIAN ™ tiles
- ArcStorm™ databases
- Server support for ArcStorm on Windows® NT
- Multifeature checkout
- ARC/INFO client to Spatial Database Engine™ (SDE ™)

Database Integration

ARC/INFO also reads and writes other standard spatial and image formats and supports both tiled and feature-based data management. ARC/INFO provides full support for commercial database management systems (DBMSs). Its SQL tools work directly with Oracle®, INGRES®, INFORMIX®, SYBASE®, SQL Server, and Microsoft® Access.

Oracle

Informix

Sybase

*SQL Server*

ArcStorm

Librarian

SDE

ArcStorm

ARC/INFO software's powerful data management system, ArcStorm (ArcStorage Manager), is a data facility and transaction manager that helps manage multiuser access of large geographic databases. Key components include feature-level transaction management, unified transactions between spatial and tabular data in commercial DBMSs, a seamless appearance for distributed data, archiving changes made to the database, and a client/server architecture. SQL tools can work directly with tabular data stored in Oracle, INGRES, SYBASE, and INFORMIX DBMSs.

ARC/INFO features several dozen new functions including optional read locks, new tools for feature updating, and a new MULTISELECT command. The MULTISELECT command allows the user to indicate a group of features across coverages for checkout from ArcStorm (or coverages/libraries) and for editing in ARCEDIT™. The speed of selection and following checkout of features has been dramatically accelerated.

ARC/INFO LIBRARIAN

The ARC/INFO LIBRARIAN component of ARC/INFO provides a system for managing large cartographic databases such as those covering a region, state, or country. ARC/INFO LIBRARIAN employs a unique spatial library system for efficient insertion, storage, extraction, and overall management of geographic data. ARC/INFO LIBRARIAN uses an internal spatial indexing system for partitioning geographic data into regions called tiles. These user-defined tiles may contain any number of geographic data sets (layers) with information describing the area and its characteristics.
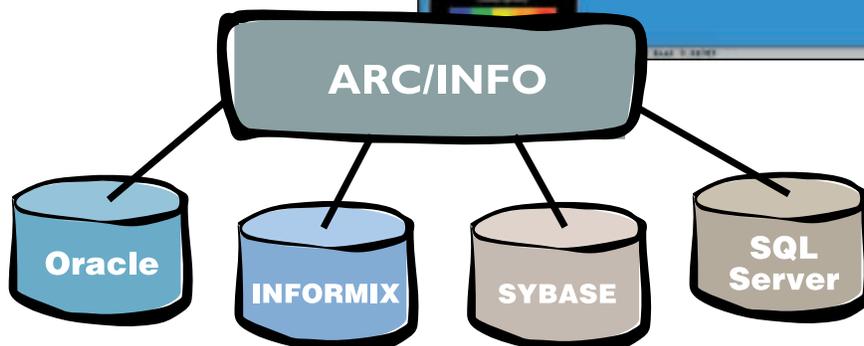
Spatial Analysis

### Exceptional Geoprocessing Tools for GIS Professionals

Spatial analysis is the process of discovering and using the contiguity and connectivity of geographic features and their attributes to perform such analysis as surface hydrology modeling, traffic pattern analysis, site suitability analysis, and bus routing.

Spatial analysis is unique to GIS, and GIS professionals throughout the world know ARC/INFO software for its extensive analytic capabilities. The heart of ARC/INFO is a rich set of sophisticated data models and spatial modeling tools.

ARC/INFO Spatial Analysis Tools

- Topological map overlay tools
- Buffer generation and proximity analysis tools
- Polygon dissolve and eliminate
- Spatial and logical query tools
- Sophisticated tabular analysis tools
- Address matching and geocoding tools
- Contiguity tools
- Coincidence tools
- Connectivity tools (with optional ARC NETWORK ™ extensions)
- Surface modeling tools (with optional ARC TIN ™ extensions)
- Raster modeling tools (with optional ARC GRID™ extensions)
- Logical expressions
- Coverage processing tools
- Aggregation tools
- Database query tools
- Overlapping polygon modeling
- Dynamic overlay
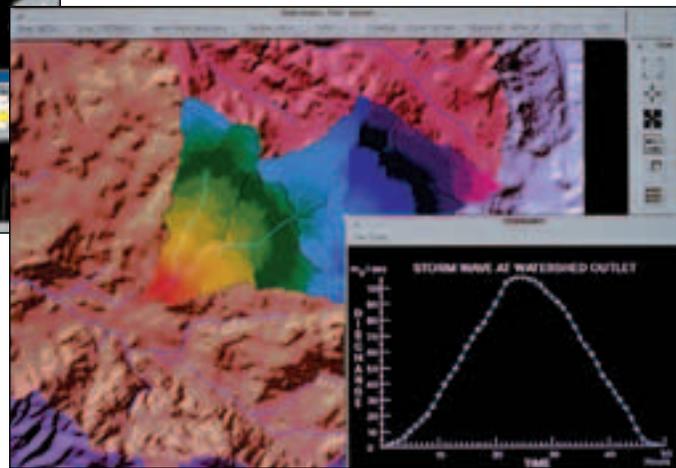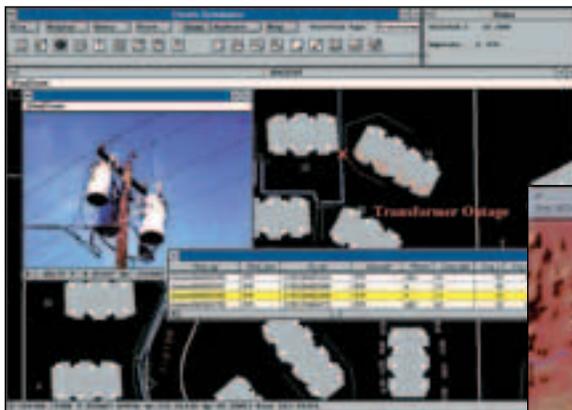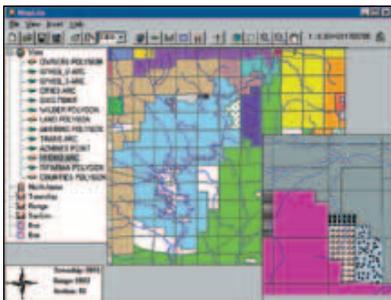
Comprehensive Network Analysis

ARC/INFO software's optional ARC NETWORK extension can be used to model and analyze spatial networks, supporting applications such as vehicle routing, transportation analysis and planning, urban planning, retail marketing, school districting, bus routing, shipping and delivery optimization, and political redistricting.

Rich Raster Analysis

The optional ARC GRID extension is a raster geoprocessing toolbox that is fully integrated with ARC/INFO. ARC GRID is valuable in helping solve real-world problems in land use planning, market research, site suitability analysis, corridor and path analysis, and dispersion and hydraulic modeling.
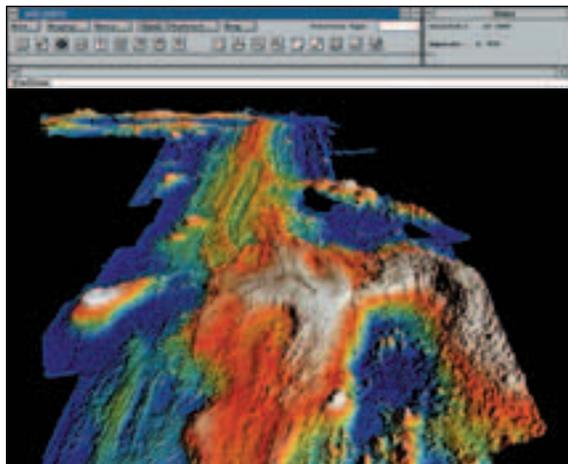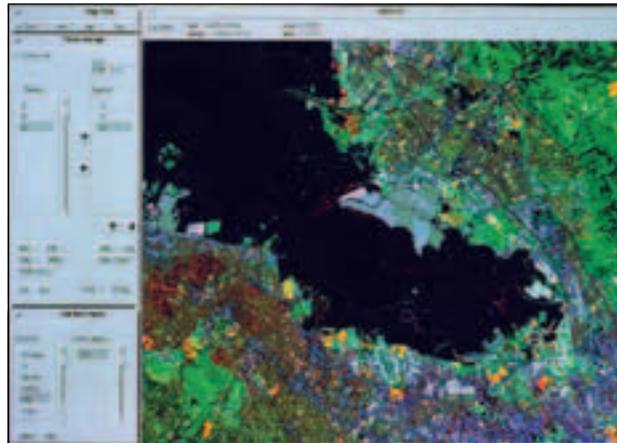

## Surface Modeling for Terrain Visualization

ARC/INFO software's optional ARC TIN extension enables the creation, storage, analysis, and display of three-dimensional surface information in the ARC/INFO environment. ARC TIN is helpful in supporting such applications as volumetric and cut-and-fill analyses, viewshed analysis, generation of engineering contours, and analysis of groundwater aquifers.

Advanced Cartographic Production
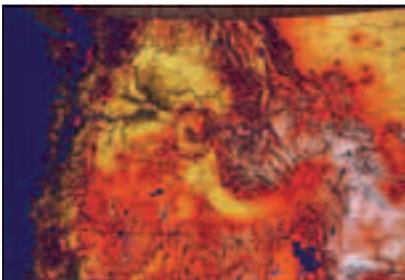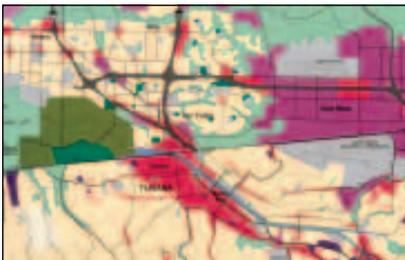
ARC/INFO Tools for Advanced Cartography

- Interactive map layout and design
- Robust data selection model
- Database-driven symbology
- Complex symbol management
- Provided symbolsets for linear, area, and point data
- WYSIWYG graphics
- True color model (CMYK, CMY, RGB, HSV, HLS)
- Provided high-quality fonts
- Support for TrueType and Type 1 fonts
- Sophisticated line generalization options
- Data classification and symbolization
- Dot density mapping for quantitative data
- Pie charts for proportional data
- Labeling and annotation management
- Key legends
- Graphs
- Coordinate grids and graticules
- Inset maps
- Scale bars
- North arrows
- Graphics import for a wide range of standard image data formats and metafiles (DXF, EPS, CGM)

ARC/INFO—Ideally Suited for Automated Cartography

When most people think of geographic information systems, they visualize a richly detailed, beautiful map. ARC/INFO software's rich set of layout and editing tools provides an advanced system for the creation of professional-looking, publication-quality maps and reports that communicate the full power of your work and show the world your results and ideas.

Database-Driven Cartography

ARC/INFO has the computer mapping and display capabilities needed to generate high-quality cartographic output. Because the software's graphics are database-driven, ARC/INFO is the ideal tool for GIS map production. The cartographic displays in ARC/INFO are based on the premise that features are drawn using symbology that represents the data. For example, roads can be organized by type and drawn with specific colors, patterns, and line weights. Features can also be labeled with street names, school names, or lot-line dimensions. The cartographic display is based on the values in the database; as the values fluctuate, the display changes without the need to manually redraw the map.

Tools for Cartographic Production

ARC/INFO offers a comprehensive tool set for cartographic production, from initial layout to final printed maps.

Graphics Interchange

ARC/INFO exports maps in several standard metafile and bitmap formats that can be used with other graphics applications and page layout programs. Supported formats include

- Adobe Illustrator (AI)
- Encapsulated PostScript (EPS)
- Computer Graphics Metafiles (CGM)
- Windows Metafiles (WMF)
- Enhanced Metafiles (EMF)

The ArcPress™ extension provides raster support for

- HP RTL
- HP PCL
- Epson (ESC/PC)
- Versatec Raster (VRF)
- CalComp (CCRF)
- Raster Graphics (RGI)
- Windows Bitmaps (BMP)
- PC Paintbrush (PCX)
- Tag Image File Format (TIFF)
- Band Interleaved by Pixel (BIP)
- Portable Bitmaps (PGM, PBM, PPM)

High-Quality Printing

ARC/INFO provides map output support for a wide variety of printers. Depending upon the stage of map production, you may require printouts for data checking, content verification, final color proofing, and final film production. ARC/INFO supports printer drivers that work with high-end raster printers, desktop printers, and vector printers. Output formats supported include EPS, Scitex, RTL, HPGL, VCGL, and CCRF.

Electronic prepress publishing processes are supported by PostScript digital color separation files. These files can be sent directly to high-end image setters and platemakers.

ArcPress™

ArcPress is an ARC/INFO extension for graphics rasterization and printing. Based on industry-standard PostScript page description language, ArcPress includes a PostScript rasterizer, input data interpreters, and output printer drivers for devices commonly utilized by ARC/INFO users.
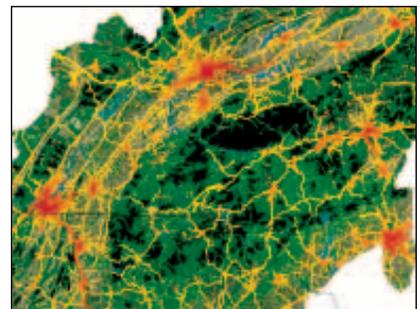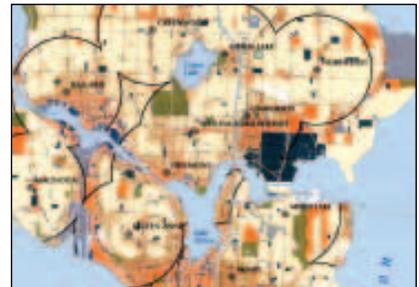
ODE

Users and developers find that all of the components and engines in ARC/INFO are engineered for use with standard programming tools. This allows ARC/INFO to be embedded within a non-GIS application and applications written using industry-standard programming languages and development environments.
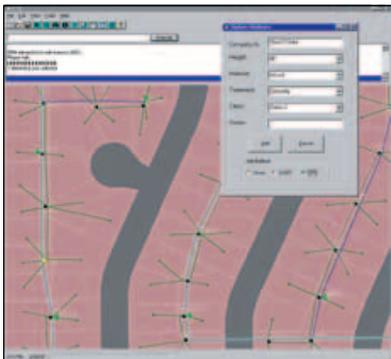
Windows NT functionality is callable via OCXs using Visual Basic, PowerBuilder, Delphi, and Visual C++. UNIX® functionality is available as C and Xlib application programming interfaces (APIs) for developers using C, Tcl/Tk, Motif, and C++.
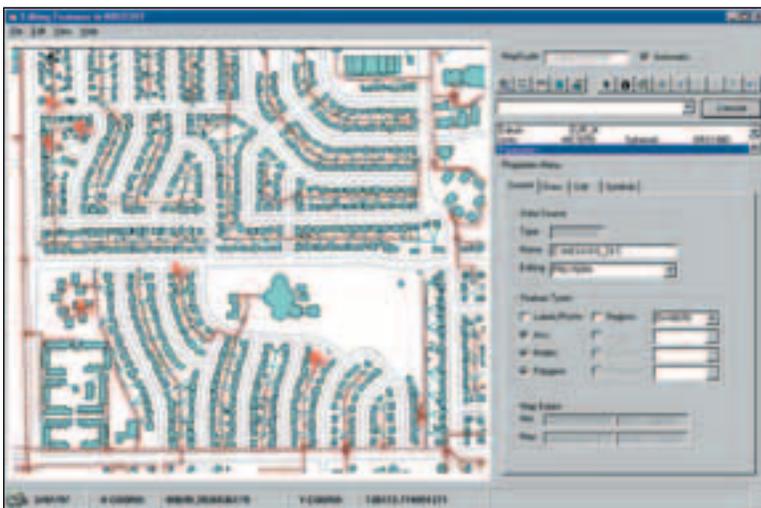
Object-Oriented Programming

In addition to the basic common object model (COM) objects and APIs, ARC/INFO includes a completely new object-oriented programming approach. ESRI has developed an object model of ARC/INFO and implemented it using Microsoft Visual Basic classes. These classes sit on top of the ODE OCXs and are easily extended by the user to include user-specific enhancements. This leads to a completely flexible and coherent integration of ARC/INFO and user defined object models. Sample applications allow developers to easily start programming with this entirely new paradigm.

The Visual Basic classes encapsulate many core editing and plotting functions, making rapid application development a reality. A new object diagram not only serves as a guide to programmers but is also an excellent visual representation of how ARC/INFO works. The ARC/INFO object model can be implemented in any object-oriented programming environment such as C++ on UNIX platforms.

A Developer's Dream

The API and objects are the highlight of ARC/INFO's open strategy, in which the software's underlying functionality is available as callable components. Users and developers have unprecedented access to build custom applications for map display, editing, and analysis with custom toolbars and dialog boxes. For example, on the Windows NT platform, ARC/INFO OCXs can be combined with other custom controls such as MapObjects™ software to quickly produce new applications. While development with ARC Macro Language (AML™) continues to be supported, ESRI encourages exploration of development with the new API. And all applications built with the new API run significantly faster!

Looking Ahead to Component Architecture

ARC/INFO software's direction toward component-based modules gives new meaning to metaphors, such as drag and drop, when users can drag an object, such as a coverage into a catalog, select a query or overlay method, and place the resulting object in a window for display. Editing will also take on a new look. Instead of editing single geographic features like points, lines, and polygons, users edit "GeoObjects," which represent real-world objects like parcels and utility lines.
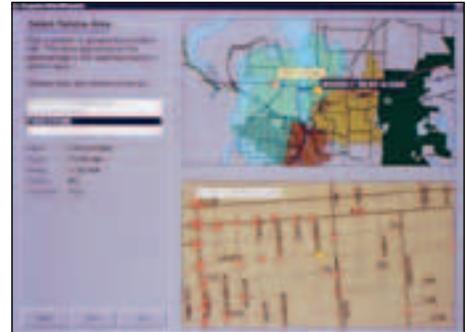
"The combination of industry-standard development environments with the proven power of ARC/INFO gives developers like us an unprecedented opportunity to build fast, efficient, state-of-the-art GIS applications."

Jeff Meyers
President
Miner and Miner
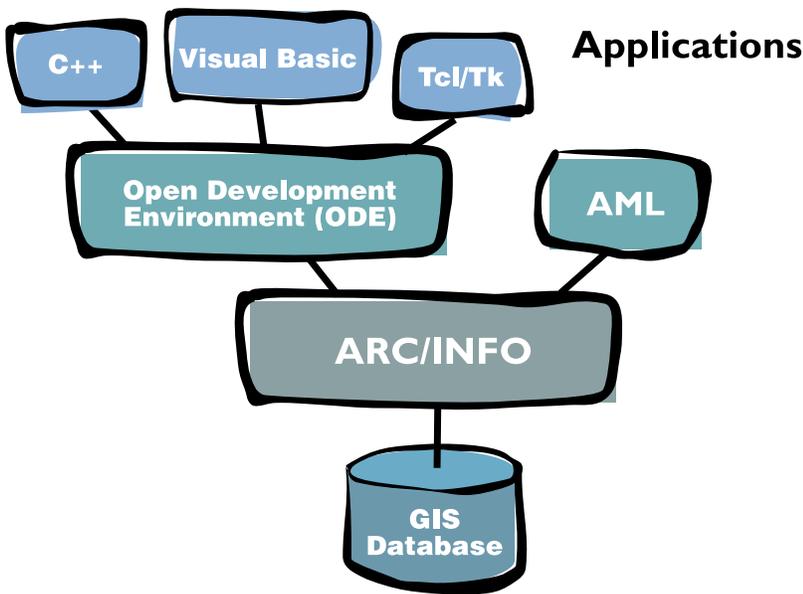
Open Platform Support
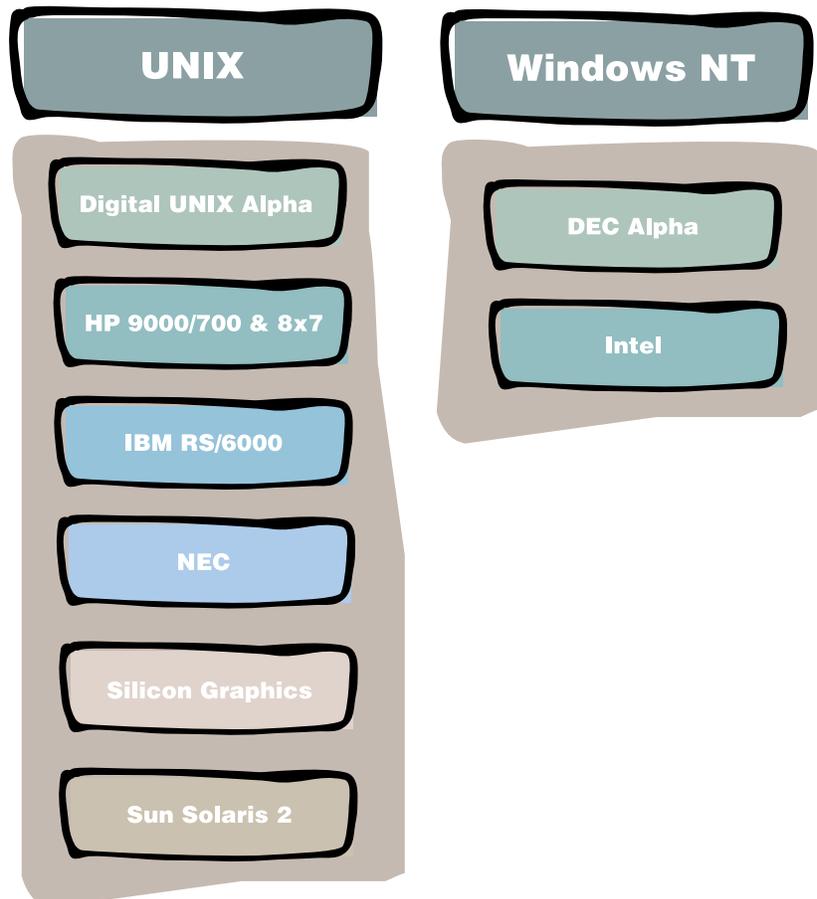
Choose the System That Works Best for You

ARC/INFO is hardware-independent, giving users a number of choices when selecting their hardware platform. ARC/INFO operates in UNIX and Windows NT workstation environments.

ARC/INFO Supports More Hardware Platforms

ARC/INFO continues to support more hardware platforms than any other GIS in history.

ARC/INFO uses the native operating system of the hardware platform such as vendor-specific implementations of UNIX. Running ARC/INFO on an unmodified platform gives you the widest range of choices and tremendous flexibility in implementing GIS in your organization. It also allows the GIS to easily run in conjunction with numerous other applications that are supported by the native operating system.

UNIX

- Digital UNIX Alpha
- HP 9000/700 & 8x7
- IBM RS/6000
- NEC
- Silicon Graphics
- Sun Solaris 2

Windows NT

- DEC Alpha
- Intel

User Support

A Long-Term Commitment to ARC/INFO User Success

As an ARC/INFO software user, you are very important to ESRI. It is our goal to help you use GIS tools as effectively as possible.

Comprehensive ARC/INFO Training

ESRI offers ten instructor-led courses that cover introductory and advanced topics related to using ARC/INFO software. Class participants take home a course notebook complete with lecture notes, exercises, and training data.

- Introduction to ARC/INFO
- Advanced ARC/INFO
- Customizing ARC/INFO with AML
- ARC/INFO Database Design
- Using ARC GRID
- Using ARC NETWORK
- Using ARC TIN
- Using ARC COGO
- Using ArcStorm
- Using ArcScan

A Variety of Support Options

- **On-line Help**

ARC/INFO includes a full set of user manuals that steps you through the key tasks, and a comprehensive on-line help system.

- **Free On-line Support**

On the Internet and the World Wide Web.

- **Telephone Support**

ESRI offers quick and convenient assistance with a team of highly trained ARC/INFO analysts to help you. Annual maintenance includes unlimited telephone support and free software updates.
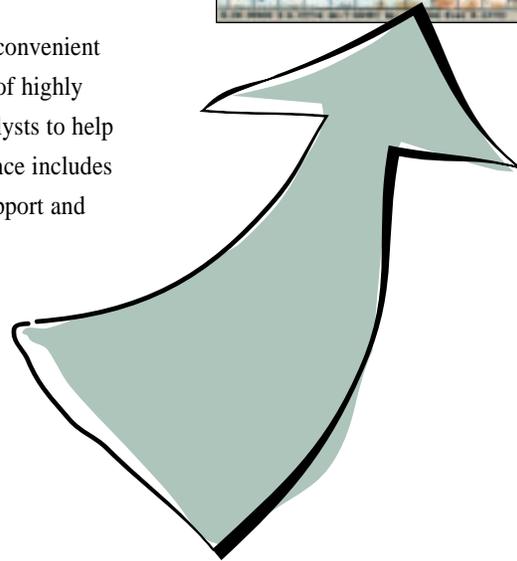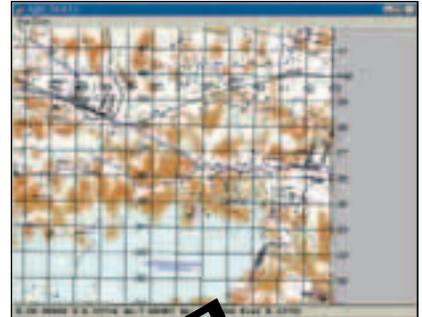
An Open Road to the Future

ARC/INFO software's open standards, client/server computing, integrated data access, and open development environment give users more opportunities to choose technical alternatives and preserve investments in data and expertise. With coming releases, users can expect stronger support for industry-standard development environments, drag and drop, object technology, support for long transactions, conflict resolution, and versioning crucial for multiple user environments. And for the first time, data sets will store their own metadata detailing significant information. ARC/INFO is GIS.

For more than 25 years ESRI has been helping people manage and analyze geographic information. ESRI offers
a framework for implementing GIS in any organization with a seamless link from personal GIS on the
desktop to enterprisewide GIS client/server and data management systems. ESRI GIS solutions
are flexible and can be customized to meet the needs of our users. ESRI is a full-service GIS
company, ready to help you begin, grow, and build success with GIS.

CORPORATE	**REGIONAL**	**INTERNATIONAL**
	Alaska 907-344-6613	Australia 61-9-242-1005
ESRI 380 New York Street Redlands, California 92373-8100 USA Telephone: 909-793-2853 Fax: 909-793-5953	Boston 508-777-4543	Canada 416-441-6035
	California 909-793-2853, ext. 1906	France 33-1-46-23-6060
For more information or to order ARC/INFO, contact ESRI or your authorized ARC/INFO Reseller.	Charlotte 704-541-9810	Germany 49-8166-677-0
	Denver 303-449-7779	India 91-11-620-3801
1-800-447-9778 (1-800-GIS-XPRT)	Minneapolis 612-454-0600	Italy 39-6-406-961
	Olympia 360-754-4727	Poland 48-22-25-6482
Outside the United States, contact your local ESRI office or international distributor. For contact information call 909-792-2853, ext.1-1235	San Antonio 210-340-5762	South Asia 65-735-8755
	St. Louis 314-949-6620	Spain 341-559-4375
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