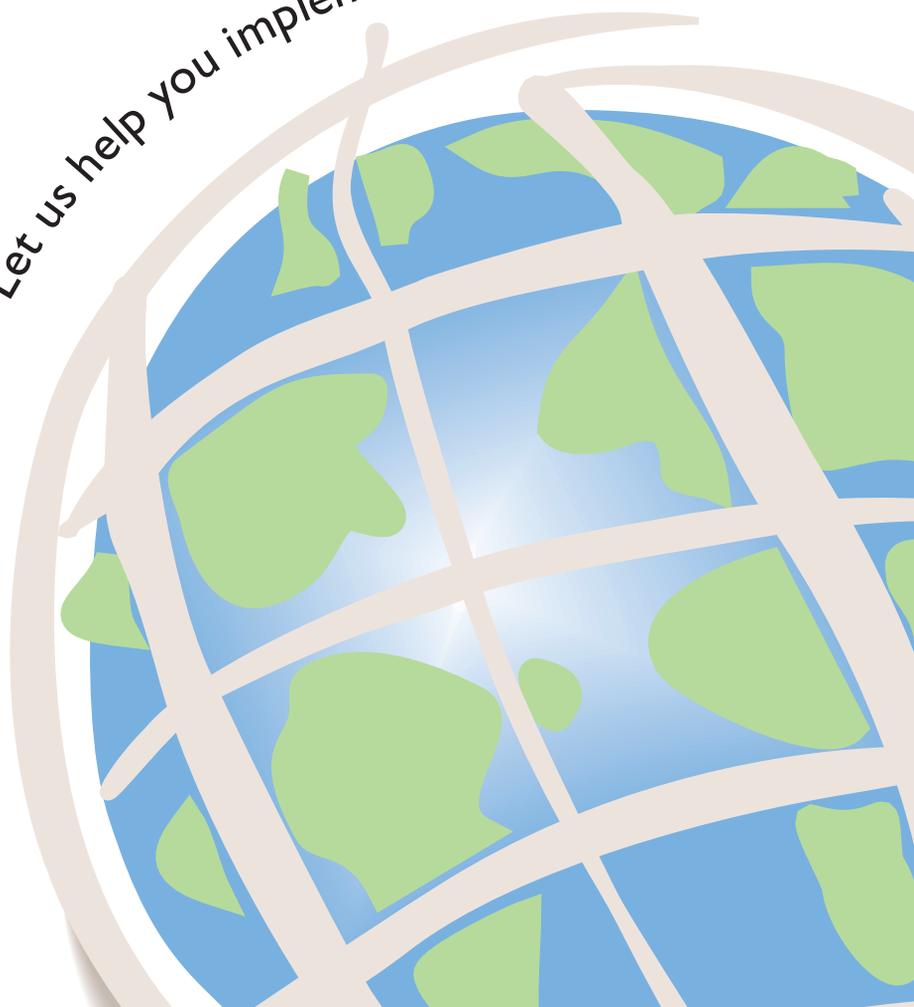




ESRI

ESRI[®] Professional Services

Let us help you implement your GIS!



ESRI Professional Services

Markets Supported by ESRI

ESRI provides services to a diverse and growing set of clients in the following industries:

- Defense
- State and Local Government
- Electrical
- Gas
- Water/Wastewater
- Environmental
- Public Safety
- Health Care
- Transportation/Logistics
- Business
- Oil/Gas/Pipeline
- Forestry and Land Management
- Telecommunications
- Natural Resources
- Agriculture

ESRI offers a wide range of high-quality professional services supporting geographic information system (GIS) design, development, and implementation.

While perhaps best known for its flagship GIS solutions, ARC/INFO®, ArcView® GIS, MapObjects™, ArcView Internet Map Server (IMS), MapObjects Internet Map Server (IMS), and Spatial Database Engine™ (SDE™) software, ESRI also maintains a significant presence in the business of applying GIS technology and providing related services. Since 1969, ESRI has supported thousands of organizations throughout the world in the design, development, and implementation of GIS tools and technology. Services range from short-term implementation support to development of complete digital databases and application solutions.

ESRI uses an interdisciplinary approach in providing professional services. Client support needs are carefully evaluated to ensure that the individual or team identified to undertake the effort will have the skills, knowledge, and abilities required to implement the service.

By applying the latest GIS techniques and tools (often before their commercial release) to all projects we pursue, we provide clients with effective solutions while advancing the state of GIS technology.

ESRI Professional Services Staff

The commitment of ESRI's staff to advancing the use of GIS has substantially contributed to the success of the company and its technology. ESRI's Professional Services staff is made up of over 200 experienced GIS professionals working out of Redlands, California, and our regional offices. The Professional Services Division includes the technical, management, and administrative staff required to provide GIS support services to a broad range of users throughout the world. The technical staff is comprised of consulting, data conversion, and programming experts with extensive experience in GIS and information technology (IT) domains. These include systems engineering, geography, cartography, computer science, operations research, logistics, facilities management, planning, land surveying, terrain modeling and analysis, geology, hydrology, forest science, and many others.

These experts use ARC/INFO, ArcView GIS, ArcCAD®, SDE, MapObjects, ArcView IMS, MapObjects IMS, and other related software every day. Because many ESRI consultants and technicians come directly from the GIS user community, they are sensitive to the needs of our clients. They continually acquire hands-on GIS project experience, placing emphasis on the quality of services delivered and the satisfaction of our clients.

Our Methods

ESRI employs a structured system development methodology for its GIS application and database projects. ESRI can provide full service support to organizations through all steps of a project's life cycle or can provide focused support through technology transfer for individual steps or specific tasks. For larger and more complex projects, the development methodology is more formal and is fully documented at each step. For smaller projects, the same tasks must be accomplished, but they can often be done informally using a rapid prototyping approach.

ESRI's methodology includes the following:

- Project Planning
- Requirements Analysis
- Database Design
- Application Design
- Database Development
- Application Coding and Testing
- Quality Assurance
- Documentation
- Installation and Training
- Support



General Services Available

Consulting and Project Management

Project planning, database design, system design, and management consulting

ESRI offers a full range of consulting services including project design and planning, project management, GIS orientation seminars and workshops, requirements analysis, database design, application design, system configuration, and integration consulting. These services are available within the context of a complete project life cycle, or consulting support can be provided a day or week at a time to offer advice and guidance during key phases of a project.

Programming

Design and coding support using ESRI® software, industry-standard languages, and integration with related technologies

ESRI programming staff are expert at developing applications based on ESRI software and related industry-standard technologies. In addition to ESRI software languages such as ARC Macro Language (AML™) and Avenue™, they use third-generation languages such as C, C++, Visual Basic®, and Visual C++®; Web-authoring languages such as HTML, Java™, and JavaScript™; and technologies such as ActiveX®. Staff members also work with all commercial relational database management systems. ESRI works with organizations to determine software requirements and uses rapid application development (RAD) techniques and pilot studies to demonstrate those concepts before final coding. ESRI can provide a programmer to solve an individual problem, design a component of a system, or peer review designs and code. Alternatively, ESRI can develop complete turnkey GIS solutions.

Database Development

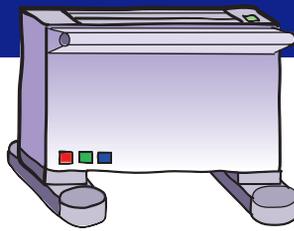
Development of data conversion tools and procedures, database development from hard-copy sources, quality assurance planning, and conversion of digital data to ESRI product formats

ESRI maintains a large facility designed specifically to support both prototyping and high-volume production of urban, regional, natural resource, business, utility, and defense/federal databases. In building these databases, ESRI's highly trained production staff utilize a suite of integrated GIS software on state-of-the-art hardware. ESRI conducts high-volume hard-copy data conversion projects utilizing a variety of data capture techniques including digitizing, optical scanning, feature recognition, and raster-to-vector conversion technology. In addition, ESRI converts third party data to ESRI and other standard data formats. Staff implement photogrammetry, photointerpretation, feature extraction, and image processing methodologies to develop digital databases and hard-copy products from imagery. ESRI conducts ongoing research into process improvement and production tool development and transfers these tools and technology to other organizations.

Quality Assurance/Quality Control

Design and code review, complete software testing, quality assurance of databases, and development of quality assurance/quality control (QA/QC) plans for databases and software

ESRI provides a comprehensive quality control program for ensuring the quality of software and data. An independent QA/QC group within ESRI develops quality assurance plans for each database or application being built or any third party data being evaluated. Each plan identifies the appropriate QA/QC procedures to be employed during the application and database development process. The QA plan includes a formal peer review process that evaluates proposed database designs, application code, and all production processes. ESRI



utilizes a full suite of automated software tools and manual checks at critical review points to build quality into the database or application development process. ESRI can

customize these tools and procedures and make them available for your organization.

Documentation

Development of documentation standards, design and development of online help via industry-standard desktop tools, and general documentation support

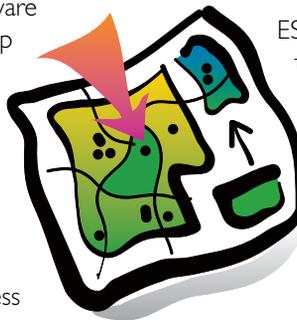
Effective documentation is a key element in the successful use and maintenance of GIS systems, applications, and databases. Whether the documentation is provided electronically through online help or as hard-copy manuals, ESRI has established and implemented processes and procedures for system documentation. For online help and documentation ESRI utilizes the latest desktop tools and industry standards such as Intranet-based document systems. In support of complete life cycle GIS projects, ESRI has experience documenting needs assessments, database designs and system designs, and creation of manuals for programmers and users. ESRI will also document database and application development procedures and methodologies to support technology transfer of data conversion and application customization projects.

Custom Training

Formal (classroom) and informal (technology transfer) training designed to meet specific user requirements and goals

ESRI provides custom training that is designed to meet specific organization and user needs. This normally involves limited modification of a standard ESRI course to focus the training on the subjects of primary importance. Under special arrangements, ESRI can design a completely custom class with new courseware that incorporates user-defined scenarios, exercises, and data.

Both formal and informal custom training can be provided to our clients. Formal training includes



prepared course materials, lectures, and hands-on exercises provided at ESRI or at the client's site. Informal training is a method of technology transfer by which an ESRI staff member works side by side on select tasks with one or more users at a client site. Whether the training is formal or informal, the goal of ESRI training is to support users so that they become productive and self-sufficient as quickly as possible.

Specialized Service Areas

Strategic Implementation Planning

Consulting and management support to define a clear path for successful implementation of GIS

It is critical to implement GIS and related technologies within the context of the broader organization mission statement and goals. ESRI can support development of comprehensive strategic implementation plans that provide a blueprint for developing and maintaining GIS operations within the organization. This planning can address administrative, policy, and personnel considerations, as well as the specific detailed steps of implementing a complete GIS system or an individual application or database. Critical success factors, deliverables, realistic schedules, measurable milestones, and an assessment of personnel requirements are all part of this planning process.

Enterprise GIS and Data Warehousing

Design, engineering, and programming of enterprise GIS solutions and data warehouses

The presence and use of geospatial information and applications are rapidly increasing throughout the government and business sectors. ESRI can provide



effective IT solutions employing commercial off-the-shelf (COTS) GIS technology, relational database management systems (RDBMSs), and client/server architecture in a data warehouse environment. New technologies allow the integration of spatial data with an organization's legacy tabular data to create a spatial data warehouse. This integration allows planners, scientists, and managers to view their data with maps and see patterns and relationships that they may not

have seen before. Software applications that "mine" the data warehouse may be sophisticated GIS and data analysis applications, simple desktop data query and visualization applications with

Internet/Intranet access, or spatial applications embedded in custom code and integrated with other COTS and third party software.

Systems Engineering/Systems Integration

GIS systems engineering throughout the system life cycle, systems integration of ESRI COTS and third party COTS software, database management systems (DBMSs), and hardware and network systems

ESRI provides systems engineering and systems integration services for ESRI COTS and third party products. Services are available in support of activities at any stage of the system's life cycle. GIS systems engineering services include needs assessment; requirements analysis; conceptual and physical database design; data dictionary development; prototyping; software design and applications programming; unit, integration, or functional software testing; independent quality assurance for data or software; hardware, software, and data integration; application documentation; and on-site maintenance of application software.

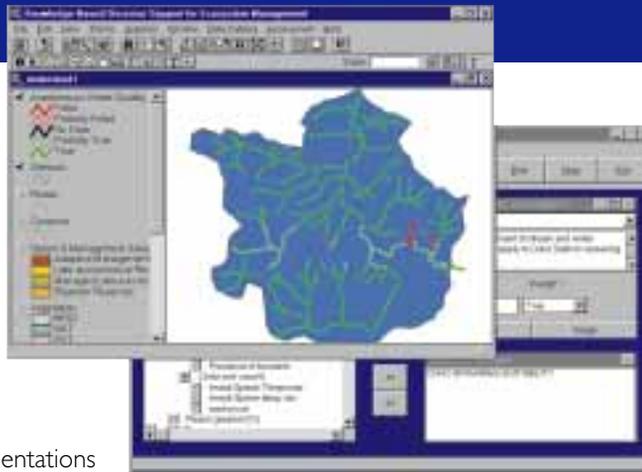
In this engineering/integration role, ESRI is sometimes involved as the prime contractor, but is often part of a larger team through subcontracting arrangements with large aerospace or technology firms.

Many GIS system implementations require integration of additional third party COTS solutions. ESRI specializes in knowing how to integrate ESRI software with third party software and hardware into an overall geospatial solution for a client. ESRI can design COTS hardware architectures and perform hardware integration for a wide variety of hardware components including servers; client workstations; specialized equipment such as scanners, plotters, film writers, and CD publishing devices; and computer network components. ESRI staff have integrated systems from a wide variety of hardware manufacturers, DBMS vendors, and data vendors. As a result, they are able to provide objective technical evaluations of these components and recommend the best performance/price solution.

Modeling and Model Integration

Integration with existing models, and design and development of decision support systems

Models can be a critical element of an overall management, planning, engineering, or scientific project or an operational environment. Many existing models that operate in a tabular or database environment can be made more robust by integrating them with GIS and the kinds of data that GIS can provide to the model. Model outputs



become more visual, and the results, which are geographic or spatial in nature, can be displayed on a map, which in itself often provides additional information or insight into the problem at hand. For simple problems and models ESRI can assist with

providing a linkage between the model and the GIS. This will provide users with consistent access for model input/output through an easy-to-use interface. ESRI can also support development of more complex and integrated decision support systems with integration of knowledge-based systems.

Internet/Intranet Services

Consulting and programming support services to publish and distribute spatial information over the World Wide Web

The Internet/Intranet is perhaps the most powerful distribution medium, reaching around the globe to any site with Internet access. Using this technology, agencies can deliver up-to-date geographic and tabular data to their staff, other government organizations, and the public. ESRI has developed and implemented tools that make viewing dynamic maps and uploading or downloading data electronically via the Internet a simple process. Through integration of ESRI software with a variety of programming languages and third party tools such as C, C++, HTML, Java, Delphi, and Visual Basic, ESRI is able to provide a wide range of Internet/Intranet mapping solutions that support UNIX, Windows, or Windows NT platforms.



Operations Support

Designing GIS solutions for scheduling, maintaining, and managing the facility resources of an agency

ESRI can supply GIS applications solutions designed to effectively maximize the use of agency facilities and lands. ESRI staff have specific experience and technical capabilities to design GIS solutions for a client's facility operations. Operation of an enterprise can be defined as the day-to-day activities associated with performing the core, mission-critical activities of that enterprise. These activities include operations and maintenance history tracking, future maintenance and operations scheduling, and impact analyses. Using GIS as either the foundation or as a front-end interface, ESRI can develop a custom solution to fit with the operational requirements of our clients.



Standards Development and Implementation

Implementation support for existing GIS data standards, and development of agency-specific standards for software and associated documentation

Because of ESRI's long and focused history in GIS, ESRI has relevant knowledge of GIS database and software standards. ESRI technical staff have participated in many national GIS standards committees including the Federal Geographic Data Committee (FGDC) and the Open GIS (OGIS) committee. ESRI designed and developed one of the key federal standards, the Vector Product Format (VPF), used by the National Imagery and Mapping Agency (NIMA) and U.S. defense forces. ESRI Professional Services staff have specific knowledge of the FGDC metadata standard, the Spatial Data Transfer Standard (SDTS), the National Imagery Transfer Format (NITF) standard, the Digital Geographic Exchange Standard (DIGEST), and the

International Hydrographic Organization (IHO) data standard known as S57.

Data Publishing

Design, development, and manufacturing of data products for publication on CD or via the Internet

ESRI has assisted many organizations in distributing their data to other agencies, libraries, schools, and the public. ESRI staff work with an organization to develop a product concept, design and build the database, include viewing software, review and resolve legal issues, develop the documentation, integrate and test the product elements, manufacture the product, and distribute it via CD-ROM or Internet technology. ESRI can be responsible

for all or some of the tasks or can provide limited and focused support to organizations that do the bulk of the work themselves.

A Unified Approach

One of the most rewarding benefits our clients have from working with ESRI's Professional Services staff is the close relationship those staff members have with state-of-the-art GIS technology and their special knowledge of the future directions for ARC/INFO, ArcView GIS, ArcCAD, SDE, MapObjects, and our entire line of GIS software. ESRI's Professional Services staff take advantage of the most up-to-date GIS software functionality and interact with the broad spectrum of RDBMSs and related technologies. They provide customized consulting and design services for the entire suite of today's GIS databases and applications for a wide range of GIS disciplines.



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.

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To order ESRI software, or for a reseller near you, call ESRI at

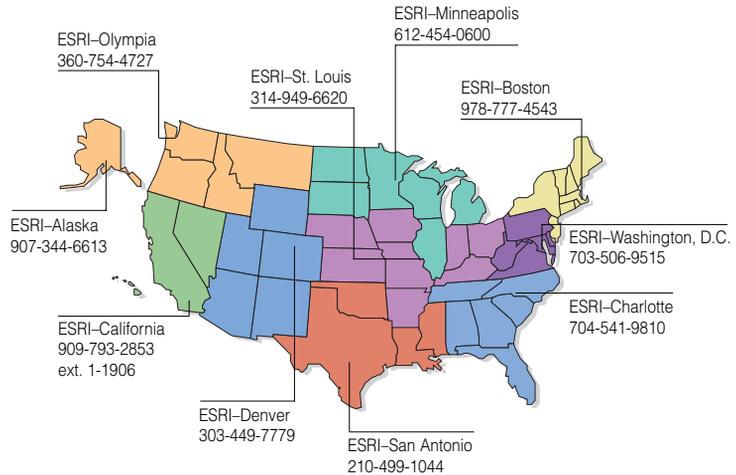
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