



## THE WORLD ON A SCREEN

ESRI maps a course for the future of government through innovative and easy-to-use GIS technology.

Computers have always been dedicated to the organization of knowledge, but the importance of easily and precisely understanding — and thus using — that knowledge has often been overlooked.

Given the nuances and subtleties of language, it is not unusual for even the best-run agencies, departments and governments to experience communication breakdowns.

However, geographic information systems (GIS) offer an exacting, tangible way to conceptualize and understand the majority of issues and actions addressed by public-sector entities.

Further, ESRI's GIS technology provides innovative functions that can increase productivity while facilitating both communication and decision-making.

"GIS allows public administrators to visualize what's going on," said Jack Dangermond, president of ESRI, the world leader in GIS technology. "And by seeing it, you can direct resources — whether it be money, staff time, a police force or an educational emphasis — in the direction of the problems."

The unique capabilities and broad applications of a GIS are well known to Dangermond, who founded ESRI in 1969 as a consulting firm specializing in land use analysis projects.

By the late 1970s, requests to purchase software created by Dangermond's 100-person staff started pouring in. A few years later, following the vision of Senior Software Engineer Scott Morehouse, ESRI began packaging its software as a product rather than a service. ESRI continues to provide

California Resources Agency shares vital data through GIS portal.

"The CRA and many of its constituent departments make extensive use of GIS to further our mission of conserving and managing California's natural resources for the enjoyment and benefit of our citizens," said John Ellison, information officer for the CRA.

CRA shares the data through the California Environmental Information Catalog (CEIC), which the agency describes as a first-of-its-kind, Web-based, self-publishing metadata catalog <<http://gis.ca.gov/catalog>>. The CEIC allows all types of organizations to catalog and publish GIS and other data, and then share it via the Internet. CRA also offers a companion site, the California Spatial Information Library <<http://gis.ca.gov>>, that provides an online repository of framework GIS data for California for downloading. This collection of data can be viewed using an application built using ESRI software.

Although the portal is new, CRA and its constituent departments have used GIS data for more than two decades. "Our use of GIS continues to grow and is now well integrated into our programs and operations," Ellison said.

Ultimately, the ESRI GIS helps CRA and constituent agencies protect vital natural resources in California. Or, as Ellison said simply, "GIS has allowed us to provide better services and improve our operations."

“GIS has allowed us to provide

Today, ESRI is the largest producer of GIS software in the world, implemented by more than 140,000 organizations and used by more than one million individuals on any given day.

Despite that unprecedented success, ESRI's current staff of more than 2,700 remains focused on meeting the needs of the people and organizations they serve.

“Our applications are in many different fields,” said Dangermond. “They’re in healthcare. They’re in planning. They’re in the utilities. They’re very much in local government — that’s about one-fourth of our total business. They’re in the military. They’re in forestry. About 60 percent of our focus is public sector.”

Each year ESRI spends about 25 percent of its revenue on research and development. With more than 600 researchers working to meet changing customer needs, ESRI remains at the vanguard of GIS development and implementation.

So exactly how do agencies, departments and governments take full advantage of a GIS? Certainly there are — and always will be — a large number of desktop users. By accessing GIS desktop tools, professionals improve productivity in a number of ways. Planning departments use GIS to make plans. Police analyze crime patterns or chart incident information. Fire departments note implementation of abatement projects. And divisions of forestry look for trends in vegetation growth or deterioration.

But desktop applications are only a small part of what a GIS has to offer. This year, ESRI is introducing ArcGIS Server.

"It can connect all the activities that an organization does because they all have geographic context," explained Dangermond. "And I think the important thing to realize is that a geographic information system is an information system."

better services and improve our operations.”

– *John Ellison*, information officer, California Resources Agency

Over the past few years, ESRI spent nearly \$300 million reengineering its products. The new technology allows GIS to become a framework for organizing government information. And unlike information systems based on financial or personal data, a geographic information system can present data that's much more relevant and cross-cutting.

Though this GIS-centered approach is just beginning to emerge, it offers unlimited potential for public-sector use. Server technology allows several layers of information to be combined, providing a detailed view of many different aspects of a geographically specific item, location or route. Furthermore, updates made by one department are immediately integrated into the central server and are available to all users.

Ultimately, ArcGIS Server allows government to structure data in a way that's extremely relevant to internal staff and citizens.

“GIS is unique because it deals with real geographic things like roads, bridges, pipes, buildings, parcels and electrical networks,” said Dangermond. “It's the abstraction of real things that people care about.”

In their quest to connect directly with the individuals they serve, many agencies are implementing GIS systems as e-government tools. A GIS can allow citizens to see plans, problems, proposals and a variety of other data in an easily comprehensible and meaningful way.

Indeed, new and creative applications of GIS technology are being implemented every day. Some organizations have even connected their personnel in the field with real-time GIS applications that allow them to immediately respond to citizen requests, and then notify that citizen when the issue has been resolved.

Naturally, when communication — both in and across organizations and also between organizations and the community — flows efficiently and smoothly through the use of easy-to-understand visual data, savings in both time and money inevitably follow.

In fact, helping public-sector agencies do more with less is a key focus — and a key benefit — of ESRI's GIS software.

### Portal for Your Thoughts

The grasp of GIS technology reaches far beyond effective, specific and sometimes narrowly defined solutions. It also embraces the broadest of global visions.

GIS networks and GIS portals are just-emerging technologies, but they hold the key to delivering geospatial information to virtually anyone anywhere on the planet.

GIS networks are systems of servers that distribute geographic information via an Internet portal. Basically, information provided by the portal can be thought of as layers of maps. Users access the information with a Web browser.

“These are different servers, different services,” explained Dangermond. “But the maps are

## SHOW ME THE INFRASTRUCTURE!

Saco, Maine, uses GIS to become one of first to comply with tough new accounting requirements.

An effort to comply with new government accounting regulations prompted Saco, Maine, to use its ESRI GIS as the framework to organize a broad range of infrastructure information.

“We developed our GIS at the same time we were trying to implement and comply with the requirements of Statement 34, and it worked out perfectly,” said Lisa Parker, finance director for Saco.

Issued by the Governmental Accounting Standards Board (GASB), Statement 34 requires, among other things, the recording of all a city's infrastructure assets piece by piece. “That means our roadways, sewer systems, our streetlights — all of the infrastructure assets that a city owns,” said Parker.

Now thanks to the GIS, not only has Saco's entire infrastructure been documented and mapped using GPS coordinates, but city workers also are in the process of linking video clips to individual items.

Saco's efficient new GIS took about a year and a half to implement and allowed the city to be among the first in the nation to comply with Statement 34 requirements.

“Since that time we've been adding layers and doing outreach to see what other departments might have an interest in doing with GIS,” said Parker.

The city recently created a link between its financial system and its ESRI GIS, allowing taxpayers to use the Web to find information such as the value of their homes. Web access to the GIS also allows citizens to do such things as view their property value in relation to homes in the rest of the city.

The technology doesn't only improve citizen services. It also boosts efficiency.

“The assessor has said approximately 2,400 calls that used to come into the assessing department annually are now not coming in because citizens can access that information right on the Web,” Parker said.

“We're constantly evolving,” added Parker. “It's been very well received by all departments in the city. It's created an awareness across city departments as to the value of GIS.”



“We have added a **homeland security focus** to our state’s GIS strategy.”

– *Carolyn Purcell*, CIO, Texas

geo-referenced so I can overlay them and see the integration of data just like I do inside of a GIS, but using basic Internet network protocol.”

Information can come from a plethora of sources including cities, counties, states and the federal government as well as private companies and organizations. The scope and possibilities of such networks and portals are just now becoming evident.

On June 30, the federal government — with the help of ESRI — launched [www.geodata.gov](http://www.geodata.gov), a Web site commonly referred to as the Geospatial One-Stop.

“It’s basically a metadata server that points at all of the individual distributed servers on the Internet,” said Dangermond. “It’s like a big library card catalog where I can search and find the image that I want, the data that I want.”

This unprecedented access to geospatial data promises to affect nearly every profession, organization and agency in the world and will likely completely change the way geography is perceived and taught in schools.

That all-encompassing geographic framework is something Dangermond has been working toward for 34 years. “That’s the digital earth,” he said. “Or, as I like to call it, the ‘nervous system for our planet’ because it will measure and serve up all the changes to our world.”



ESRI  
380 New York Street  
Redlands, CA 92373-8100  
Tel: 909-793-2853  
Toll free: 1-800-447-9778  
Fax: 909-793-5953  
E-mail: [info@esri.com](mailto:info@esri.com)  
Web: [www.esri.com](http://www.esri.com)

This Government Technology Public CIO Thought Leadership Profile was sponsored by ESRI.  
Copyright © 2003 Public CIO. All rights reserved. Printed in USA.

## THE EYES OF TEXAS

Longtime commitment to GIS technology keeps the Lone Star State on the cutting edge of information services.

More than a decade ago — long before most state officials had heard the first whisperings about GIS applications — the Texas legislature and then-Governor Ann Richards formed a Department of Information Resources (DIR) and a GIS Planning Council.

“I have a theory about technology,” said Carolyn Purcell, executive director of the Texas DIR. “It’s best to do things across an entire enterprise, and it’s best to stay one step ahead technically.”

That was the Texas Legislature’s intent when it appropriated \$2.5 million a year for four years (1998-2001) to complete the Texas Strategic Mapping Program (StratMap). As part of the program, the state developed seven mutually compatible statewide GIS data layers and made them available in the public domain.

StratMap now forms part of an extensive repository of geospatial data in Texas. “Suffice it to say that there are so many areas where GIS is an appropriate platform for delivering information,” said Purcell. “In a lot of the informational disciplines, geography gives context and enriches it dramatically.”

GIS technology from ESRI has proven valuable for confronting a number of unexpected challenges in the state, including homeland security.

“We have added a homeland security focus to our state’s GIS strategy,” said Purcell. “The initial priority is to identify and accurately locate our critical facilities, and to use spatial analysis functions of GIS to aid in vulnerability assessment. This will allow us to better provide federal, state and local response teams or interdiction teams with the information they need to quickly assess and control a situation.”

In February, Texas faced another challenge that demanded immediate response — tracking and mapping debris from the Columbia Space Shuttle tragedy. Almost immediately after the accident, hundreds of specialized maps were being generated using GIS and StratMap data to aid the massive debris search effort. Using the GIS technology, each piece of recovered debris was geographically charted, aiding in NASA’s investigation and reconstruction of the event.

“It was really valuable,” said Purcell. “And it was because Texas had a robust GIS base we could employ that we were able to do that, and do it as easily as we did.”