Chapter 1

Save time

Time management is a constant factor for improving service levels or increasing customer satisfaction. Introducing GIS into workflows or allowing the technology to automate processes tends to generate significant time savings by either speeding up process tasks or eliminating steps altogether. Besides saving labor hours and increasing turnaround time on tasks and projects, GIS benefits an organization's ability to do jobs that would otherwise be shifted to overtime, delayed, or left undone. Organizations that apply georeengineering efforts to increase efficiency or productivity can accomplish more tasks in the same period.

GIS applications free staff time and shift workloads. Analyses with GIS range from performing multiple "what-if" scenarios to automating entire manual processes. With GIS, tasks that took hours, weeks, or months to complete are finalized in minutes. Today's GIS leverages web-centric applications and mobile smart devices to yield government on-demand and on-the-job workforce applications.

GIS has proven itself as a success in time management. It helps governments meet or exceed projected timelines or lessen the time required to complete traditional workloads, despite the perception that there is never enough time to move an organization forward or increase constituent satisfaction.

GIS keeps information flowing to response agencies and public during Queensland flooding

SECTOR: Emergency response
Ben Somerville, Esri Australia Pty. Ltd.

Three-quarters of the State of Queensland in northeastern Australia was declared a disaster zone as a result of flooding that began in late December 2010. Flooding endangered residents and inundated homes, businesses, and farmland. Agencies responding to the disaster and residents of affected areas needed quick access to current information on the evolving situation. To meet this demand, a small GIS team in the capital city of Brisbane worked on behalf of the Brisbane City Council (BCC) to develop a GIS solution that shaved forty-eight hours off the time it took to deploy an interactive and online situational awareness map for the rapidly escalating emergency response operations.

Queensland flooding creates rapid demand for GIS

Queensland residents are familiar with moderate seasonal flooding in many rural areas during the wet summer months, but the flooding that began in December 2010 quickly rose to levels unlike anything on modern record. The rapid progression in the extent and the intensity of flooding put emergency response agencies on high alert and created an immediate demand for situational awareness maps to communicate flood extents, shelter sites, and road closures. They also needed this information all within a common platform that could be shared among multiple response agencies.

There was no doubt that the agencies working the disaster needed an online GIS to provide critical information about the rapidly changing ground conditions. They had to develop and deploy a mission-critical GIS on a dedicated web server immediately, and to do so during a period of extreme regional duress. This challenge was clearly summarized by Ben Somerville of Esri Australia Pty. Ltd., who stated, "Floods don't wait for you to get your systems up and running."

GIS is rapidly deployed with cloud technology

The BCC found an answer to its geospatial needs in cloud GIS, a tightly integrated system of GIS technologies that can be deployed off-premises within a short amount of time and administered remotely. By using a cloud-based GIS solution, Somerville and colleague Nick Miller were able to rapidly construct a web-mapping application in response to the rising demand for spatial information by all of the response agencies. The GIS made it possible for the team to quickly deploy critical maps and data to those who desperately needed them to keep pace with the deteriorating ground conditions.

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Somerville and Miller worked through the night on behalf of the BCC to get a Flood Common Operating Picture (COP), with GIS at its core, up and running with the latest, most accurate information. "We were asked to create the application at 7:30 Tuesday night," Somerville said. "We went to the crisis room, gathered the data, and were back at the office an hour and a half later. Moving the data via FTP [file transfer protocol] to the cloud took the longest—nearly six hours. While that was happening, we created a local version of the COP app that we could move to the cloud. At 7:00 a.m. Wednesday, the web-mapping application was operational."

Team members working on the application saved a considerable amount of time by leveraging the cloud to build their GIS solution. No time was lost tracking down, setting up, and configuring a web server for the online GIS application because all of the IT resources they needed were already available to them within Esri's cloud solution.

The cloud-based GIS also eliminated the troubling question of where to place the hardware for a mission-critical application when most of the normal options were being cut off by flooding. The cloud servers were located nowhere near the event, yet they were still readily accessible by the GIS team working on the Flood COP. All that Somerville and Miller needed to access the application server was an Internet connection; no time was lost figuring out where to place the server or how to access it.

GIS speeds information delivery and improves flood response

As the flooding was reaching epic proportions, so were response efforts on the ground, which included local teams from the BCC, Queensland Fire and Rescue Service, Queensland Police Service, and the Australian Defense Force. The Flood COP provided by the GIS

GIS staff was able to rapidly deploy a common operating picture for agencies responding to massive flooding in and around Brisbane by leveraging a cloud-based GIS solution. Courtesy of Esri Australia.

became invaluable to these agencies by giving them near-real-time feeds of rescue activities, current and predicted flood extents, and the spatial data and maps critical for coordinating relief and rescue efforts. It was no ordinary flood event and there was no time to wait for information. The real-time situational awareness provided by the GIS equated to better coordination between agencies and faster and more targeted response efforts on the ground.

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The BCC was able to leverage massive enterprise resources in the cloud to instantaneously handle the spike in demand as the hits to the GIS site soared. Had Somerville and Miller used a traditional in-house deployment instead of the cloud-based GIS, they would not have had the resources to pull together all the additional equipment and software in time to meet the overwhelming, and unexpected, demand placed on the server.

Somerville approximated that by going with a cloud-based GIS, they were able to save forty-eight hours in the time it took to get the Flood COP up and running—an estimated twenty-four hours saved in the retrieval and set up of hardware, plus another twenty-four hours saved while installing, configuring, and testing the operating system and application software. With the intensity of the flooding quickly elevating, the time savings played a critical role in meeting the informational demands of all the overall response effort.

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The GIS-based Flood COP was a valuable public asset. It helped locals evacuate from harm's way while also helping people with friends and family in Queensland get information about the event. For example, Somerville knew of one business owner who used the timely information provided by the GIS to stay ahead of the flood and the associated road closures to safely remove over AU$100,000 of computer equipment from his building. This story was repeated many times over as residents and business owners used the GIS to determine what areas were going to flood so that they could take the appropriate action to get to safety.

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The combination of GIS with cloud technology was so successful to the region during the disaster that the BCC today maintains an ArcGIS for Server template of its Flood COP within the cloud. It is a perfect solution for incident-driven events like flood response because it essentially allows agencies to rapidly spin up the GIS applications they need, when they are needed, without having to make and maintain a large investment in hardware and software that, other than during the duration of the incident, will mostly lie dormant. As much as the BCC and its residents would rather not have to fire up the Flood COP again, it is good to know it is there in the cloud ready to provide critical GIS functionality on a moment's notice.

GIS and related technologies played a critical role during the massive flooding that struck Brisbane, Australia, in December 2010.
Courtesy of Esri Australia.

GIS delivers results to the Alameda County Registrar of Voters

SECTOR: Elections
Tim Dupuis, Alameda County Chief Technology Officer, Alameda County, California

While preparing for the next election in Alameda County, California, the county's director of information technology, Dave Macdonald, saw a clear need to modernize election workflows. Past elections were carried out effectively, but many of the processes were manual and too time-consuming. Responding to this, Macdonald initiated a project to improve election work by leveraging GIS and other technologies.

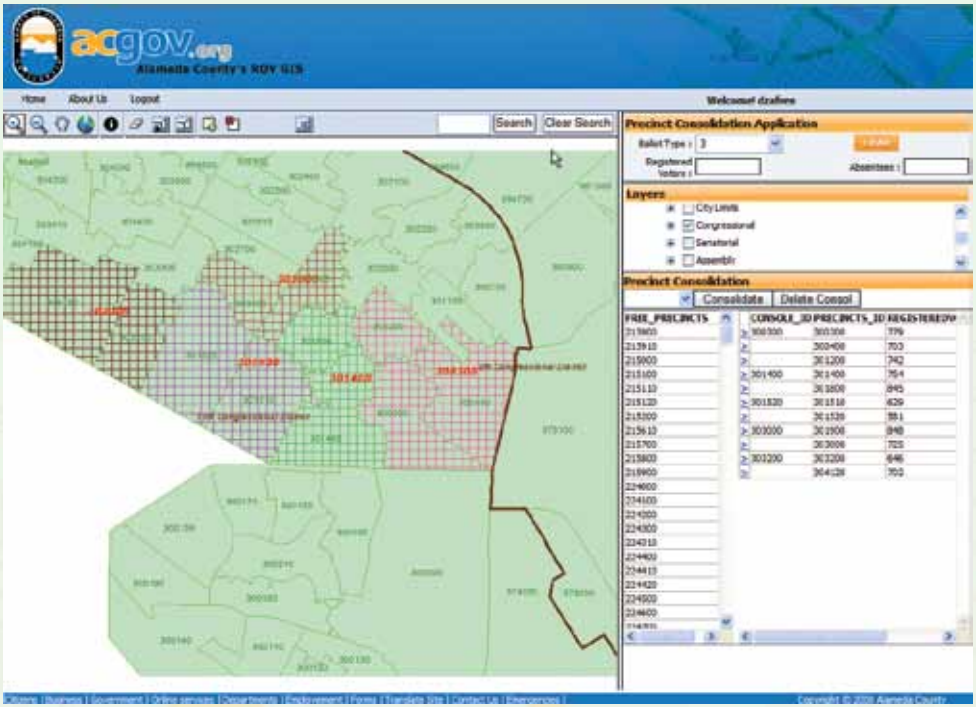
The Registrar of Voters (ROV) teamed with Weston Solutions, Inc. to develop a solution that built on the San Francisco Bay Area county's existing enterprise GIS. They incorporated the county's base layers directly into editing tasks, analysis operations, and online election maps. Specialized tools were then created for election staff to use for consolidating precinct boundaries based on specific population criteria, and GIS-based workflows were established for analyzing the suitability of building sites for new polling stations.

> Making the switch to GIS means precinct consolidation that traditionally took six election technicians up to three weeks to complete now takes three technicians one to three days to complete. Tim Dupuis, Chief Technology Officer, Alameda County

The new tools produced substantial savings by reducing the time needed to carry out critical election processes, especially in the areas of precinct consolidation and locating new polling stations. Speaking about this impact, the county's chief technology officer, Tim Dupuis, said, "Making the switch to GIS means precinct consolidation that traditionally took six election technicians up to three weeks to complete now takes three technicians one to three days to complete."

With any election comes a healthy demand for results. Knowing this, the ROV also built a public-facing website that automatically updates elections result maps in nearly real time through a direct link to the GIS. The application saves time for the public, media, and political organizations looking to quickly get results, and it also saves time for ROV personnel by reducing the number of requests they get from these same groups for election outcomes.

When asked if changing from a paper-based to a technology-based approach had a positive impact on the election day work, Dupuis stated, "We recorded some of our fastest times this year," making it clear that the switch was the correct choice for the ROV and the voters of Alameda County.



Tools, such as this one used to consolidate precinct boundaries into evenly populated zones, were built to assist election workflows. They were distributed via the county's intranet. Courtesy of Alameda County, California.

Louisiana Army National Guard deploys GIS to make the most of its data

SECTOR: Public safety
Mike Liotta, GIS Manager, Louisiana Army National Guard

From days to minutes, that was the time saved by the Louisiana Army National Guard (LANG) after it implemented a new GIS platform to manage its spatial data.

LANG stands ready to protect the safety and security of Louisiana's citizens when disaster arrives. It is called in to help when conditions are at their worst. Geospatial information is critical during these times, giving the guardsmen and guardswomen important information about what they are heading into as they set out to save lives and protect order.

After Hurricanes Katrina and Gustav, LANG realized future responses would benefit from more efficient methods for handling spatial data, especially imagery. Attaining the raw data was not the problem; in fact, it was plentiful. The challenge was making the volumes of data coming in from various sources rapidly available to LANG's operations.

During an event, large quantities of imagery and other spatial data come into LANG, such as this aerial photo of flooding. What was needed, though, was a solution for quickly operationalizing incoming data, making it available for situational awareness maps and field use. Courtesy of Louisiana Army National Guard.