case study

esri Australia

Real-time mapping transforms SA emergency response

South Australian State Emergency Service

Government of South Australia

SES RESCUE

Learn how a location-driven upgrade of one of South Australia's pivotal emergency service technologies has improved safety in the state.

Project overview

Responsible for responding to extreme weather, flooding and road crashes, the South Australian State Emergency Service (SES) fields around 10,000 calls for assistance each year. Crucial to this task is a top-line incident management system that can deliver optimal situational awareness, inform efficient and effective resource management and simplify post-event analysis and reporting.

While SES' existing system had comprehensive incident management functionality, it provided limited visibility into the spatial context of incidents and their relationships to one another, to critical assets and to infrastructure.

To enhance the existing system, the organisation added increased functionality using Geographic Information System (GIS) technology. This integration not only helped SES staff visualise their data on a map, but also enabled them to manage and spatially analyse the vast volumes of data fed into their GIS system. This permitted SES to incorporate and store a broader range of data sources in near real-time, providing a far more informed understanding of incidents as they unfold and enabling sophisticated analysis in the aftermath of events.

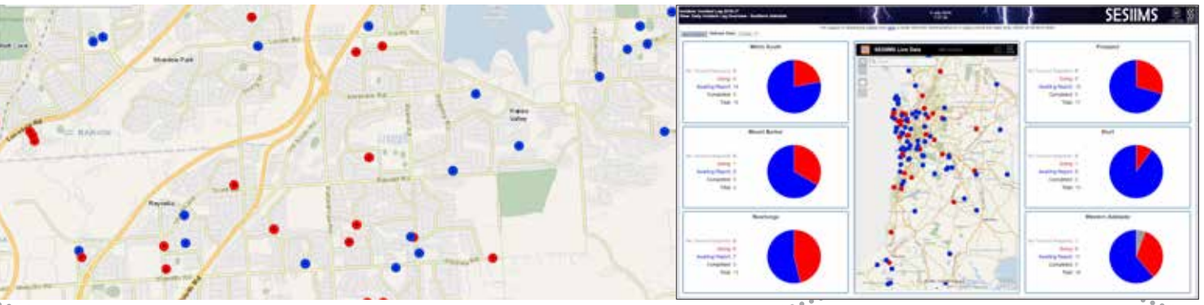
South Australian SES in focus:

The South Australian SES is a 1,700-strong volunteer-based organisation that has saved the lives and property of countless South Australians since the early 1960s, when it was known as the Civil Defence.

Over the past half-century, the organisation has morphed into a highly trained, responsive and effective emergency service agency that responds to a wide range of incidents across the state, 24 hours a day, seven days a week.

Primarily responsible for responding to extreme weather and flooding events, the SES also carries out road crash, marine, swiftwater, vertical and confined space rescues. In addition, the organisation assists the South Australia Police in land search operations and traffic management, plays an important support role to the Country Fire Service during major bushfires, and helps raise community awareness on a range of natural hazards.

> "With a system that now updates in real-time, our maps change as incidents change and reflect the shifting dynamics of an emergency as it unfolds."
>
> **Dr Sara Pulford,** SASES Principal Geospatial and Operational Systems Officer



The challenge:

The breadth of SA SES' roles and responsibilities means the organisation is active during significant emergencies, as well as 'everyday' incidents. A new operational system – the SES Incident and Information Management System (SESIIMS), built on the WebEOC platform – could handle the large volume of data associated with significant weather events, but the commercial off-the-shelf mapping plugin did not fit SES' requirements.

While data capacity was a significant issue to overcome, of equal importance was a way to visualise the range of variables associated with each incident, including the roles of potential stakeholders – such as other emergency services – the nature of the incident, its location and how long it had been ongoing.

Specifically, SES required:

- A GIS system that could cater for the vast amounts of data being fed into and held by the SESIIMS.
- A platform that could display data in a variety of ways and would provide a clearer understanding of the location, status and context of all incidents.
- The ability to visualise real-time data feeds to gain a comprehensive and clear understanding of incidents as they occurred.
- The capacity to spatially analyse historical data for post-event reviews and investigations into incidents.

The solution:

Rather than reinventing the wheel, the solution enhanced SES' existing investment in GIS technology and its incident management system with a range of features and functionalities that allowed them to meet their response and post-event analysis goals, including:

The incorporation of direct, real-time feeds

Real-time data from multiple sources is now fed into the SESIIMS to provide a clear understanding of incident status and context. Incident data is ingested into the GIS, published as a service, accessed via a web app and then embedded back into the SESIIMS. It represents a complete cycle of data generation, use and retention.

Streamlined historical data functionality

Detailed spatial analysis can now be performed immediately after an event without impacting or stalling the SESIIMS. This has replaced a lengthy, multistep process and enabled SES staff to respond to complex data requests in less than 20 minutes, as opposed to the several hours the process previously took.

Sophisticated symbology

The multitude of categories data falls into are now represented visually on a map using an array of easy-to-recognise symbols. This ensures users can quickly ascertain key aspects of an incident such as the agencies involved, incident type, job status and the time since reporting.

Portal containing customised maps to suit specific roles

A new portal was created that can be accessed by SES staff. Customised web maps and apps can now be created as needed and the content made accessible to specialised staff.

Embedded web app

A location-based operational web app was created and embedded into a number of SESIIMS dashboards, with different views reflecting specific scales – from statewide down to street level.

The innovations:

- In an Australian-first, a WebEOC-based incident management system was spatially enabled using Web GIS – an online solution that connects users across an organisation – delivering services to wider audiences in real-time.
- Incident data is now available and accessible for more advanced spatial analytics and visualisation, which not only delivers better response during an event but also informs how lessons can be learned from past response efforts.
- Previously unattainable information products can now be developed due to an increased accessibility of data, allowing SES to continue innovating and creating.
- Sophisticated symbology was introduced to enrich incident data maps and help represent a multitude of data categories. This enables managers to make more informed decisions about resourcing, while analysts can better understand the location and context of incidents.

As the state's key emergency responder, South Australian SES required a powerful incident management system that could deliver optimal situational awareness.

The outcomes:

- **Greater value from existing data.** Extracting previously locked historical data for use in a GIS-driven system has enabled SES to effectively use data post-event for the first time. This has allowed SES to conduct more sophisticated analyses in the aftermath of emergencies, increasing lessons learned and facilitating continuous improvement. Ultimately, the organisation can now use evidence-based decision-making to better prepare for the next serious event.
- **Improved response planning.** Access to real-time data, sophisticated symbology and customised mapping views means that operational personnel respond to incidents faster and more efficiently. This 'smarter' approach is achieved because staff can now visualise where incidents are occurring and deploy resources accordingly. Greater situational awareness across the organisation has improved service to the community.
- **Improved decision-making.** Having the right information at the right time has enhanced SES' ability to make timely and accurate decisions across the board, for planning, response, recovery and mitigation.

Solution mix:

- Portal for ArcGIS
- ArcGIS for Server
- ArcGIS for Desktop
- Esri basemaps
- ArcPy scripting

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