Optimize Your Department's Response

GIS for Fire and Emergency Medical Services

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Introduction

Saving lives, conserving property, and protecting the environment are the primary responsibilities of all government agencies. This is demonstrated by the high level of community resilience that is required through emergency protective actions and recovery operations coordinated across multiple levels of government. Esri provides innovative solutions that help agencies address risk identification, implement prevention activities, and respond to man-made and natural disasters.

Esri has supported the public safety community for decades and continues to participate in an effective collaboration among federal and state agencies and local governments.

An enterprise license agreement (ELA) with Esri provides both an economy of scale for use of Esri® ArcGIS® software and advanced technical assistance. This means that agencies have unlimited access to ArcGIS software along with timely and expert assistance from Esri that enables them to successfully implement and scale their geographic information system (GIS) enterprise. This has greatly enhanced the capabilities of GIS users across all spectrums of an agency including resource coordination, mapping, and emergency data records. Two areas of note are the improvements to damage assessment activities and real-time data collection. These programs provide actionable intelligence to decision-makers at the appropriate time.

An enterprise license agreement can

- Reduce complexity.
  Unite software licensing into a single organization-wide agreement.

- Optimize technology spending.
  Lower the costs of software compliance and asset management.

- Increase flexibility.
  Build a scalable system that aligns with your agency's objectives.

- Maximize value.
  Provide mapping and GIS services where and when it's needed.

Current Capabilities

ArcGIS offers a unique set of capabilities for applying location-based analytics for your responders. Agencies can gain greater insights using contextual tools to visualize and analyze your data. Collaborate with others and share your incident intelligence via maps, apps, and reports.

Spatial Analytics

Spatial analytics is the heart and soul of ArcGIS. You use it to find the best location for your resources, plan for smarter communities, and prepare and respond faster in crucial situations.

Imagery and Remote Sensing

ArcGIS gives you everything you need to manage and extract answers from imagery and remotely sensed data. It includes imagery tools and workflows for visualization and analysis and access to the world's largest imagery collection.

Mapping and Visualization

Maps help you spot spatial patterns in your data, so you can make better decisions and take action. Maps also break down barriers and facilitate collaboration. ArcGIS gives you the ability to create, use, and share maps on any device.

Real-Time GIS

Real-time GIS empowers you with location monitoring of any type of sensor or device—accelerating response times, optimizing safety, and improving operational awareness across all assets and activities, whether in motion or at rest.

3D GIS

3D GIS brings real-world context to your maps and data. Instantly transform your data into smart 3D models and visualizations that help you analyze and solve problems and share ideas and concepts.

Data Collection and Management

With ArcGIS, you can easily collect, crowdsource, store, access, and share your data efficiently and securely. You can integrate data stored in your information systems and geoenable any data from any source.

Preparedness

An agency's approach to risk reduction efforts can leverage multiple Esri solutions and technology to be successful. An example of risk reduction activities includes fuel management programs. It is a methodology that integrates fire and fuels management practices together with landowner priorities and combines them with jurisdictional efforts within local, state, and federal responsibility areas. Programs such as this leverage Esri products including Esri's ArcGIS StoryMaps℠ for public information and executive briefings, Operations Dashboards for ArcGIS for decision support and situational awareness of the program metrics, and mobile applications that allow field teams to conduct inspections and submit reports in real time from anywhere in the state.

Response

Multiple federal, state, and local agencies' emergency response activities are supported by Esri technology and solutions. The use of Esri technology by these cooperating agencies provides for seamless data sharing, improved communications, and more efficient resource management. Esri supports emergency operations centers daily with resource management and operational

response solutions. As seen above, mapping and dashboard products are prominent in a state emergency operations center where they provide real-time decision support for ongoing incidents.

Recovery

Recovery efforts to restore communities are a priority for state governments. Esri technology is leveraged to manage and report on damage assessment, monitor critical infrastructure restoration, and coordinate repopulation programs after an incident.

The importance of postfire recovery and documentation of fire impacts continues to increase, especially considering the severity of recent incidents. The total database of records collected includes thousands of structures damaged or destroyed by wildfires across the world. This was evident during recent wildfires where agencies were able to provide real-time data collection, imagery integration, and the use of Unmanned Aircraft Systems (UAS) systems to develop a common operating picture that enabled informed decisions for response and recovery.

Esri's Collector for ArcGIS is being used for data collection during damage assessment operations. It has become a valued tool for agencies to help determine disaster declaration thresholds and have an accurate record to begin the recovery process. The use of the Esri mobile application continues to be refined to improve both the quality and quantity of data collected post incident. The speed and accuracy of this application has allowed real-time data to be provided for emergency managers, as well as the development of public information products, in a timely manner using accurate and validated data.

Esri applications can be used to develop data for analysis on the effectiveness of current building codes and fire safety regulations. Esri's mobile applications and analytical capabilities provide the capability for these activities with verified data. Esri solutions provide for the analysis and communication of this data.

Public Information

Solutions from Esri provide public information products during preparedness, response, and recovery operations. These products are pushed to the public to provide information on evacuations, fire perimeters, containment status, and repopulation guidelines. This information is regularly disseminated through social media channels and traditional public information sources like the media and over
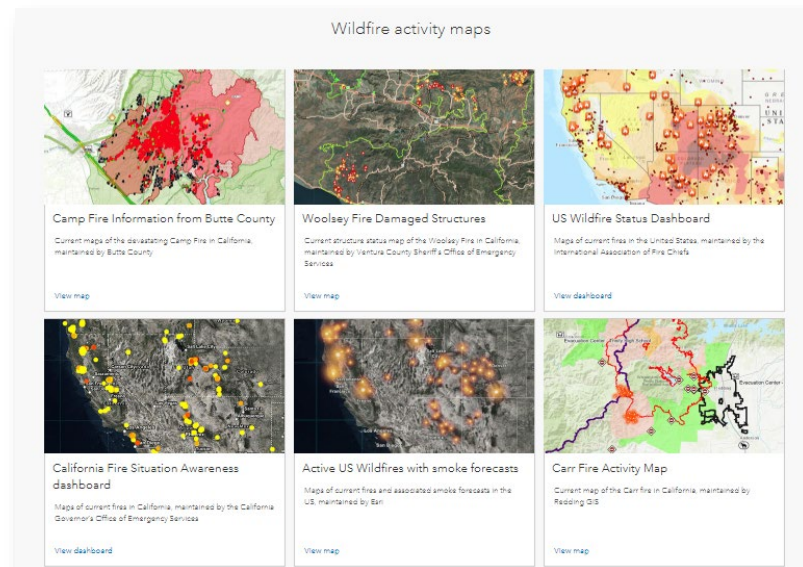

the web. With Esri's technology powering these applications, they can scale to handle millions of hits from the public and media when information is disseminated. Esri's Geospatial Cloud provides an agency a way to ensure that critical information remains up and running.

Esri Support

Esri is focused on supporting our users, and through that support, it is helping to build safer communities. Esri supports public safety programs and the multifaceted approach to incident management.

In addition to providing solutions, applications, and data to public safety agencies, Esri provides direct support for disaster response through our Esri Disaster Response Program. This program provides access to Esri technology, technical support, implementation support for public safety solutions, and help with common workflows like damage assessment or public information when an agency's capacity is exceeded.
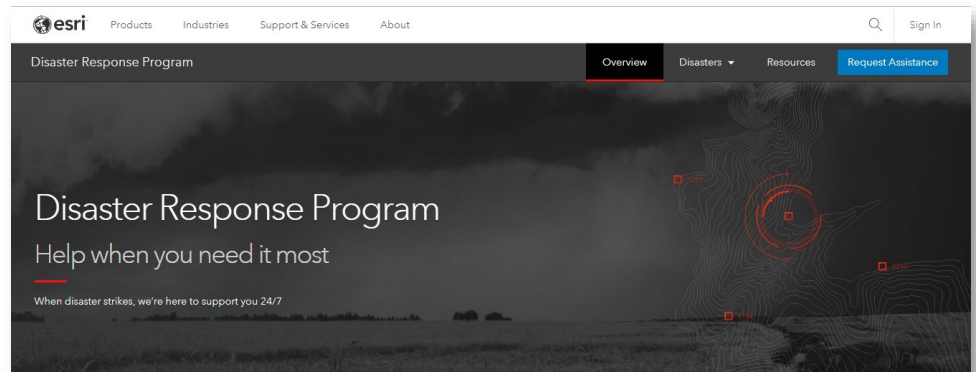
Future Capabilities

The future of GIS applications for public safety includes the development of artificial intelligence, machine learning, and 3D products. Predictive modeling capabilities continue to expand, and Esri has several partners with solutions related to wildfire modeling and its impact on life, property, critical infrastructure, and the environment.

The geospatial industry is quickly evolving because the capabilities of digital connectedness and collaboration are moving ahead exponentially. The biggest trends in geographic information system technology are centered on making data more accessible and creating context to visualize this data in an age when fast, easy access to information is taken for granted.

Spatial analysis is important to any agency that values location as a variable to success. Data can be overlaid onto a map to perform statistical analysis to decide about the location of an incident. Maps communicate this information well, and in a web services environment, agencies will be able to make maps, graphs, and charts and perform analytics easily. Accessible from an organization's cloud, the power of GIS and mapping is opened across the enterprise.

The ability to access the vast amounts of data that provide us with insight into the environment and human behavior has changed the way all organizations function. That capability has also evolved to include the integration of big data operations into spatial analysis. Today, anyone in the enterprise can access billions of environmental observations or tens of thousands of raster images from spacecraft and analyze them easily.

Leveraging this vast network of devices and sensors is perhaps the latest trend and the number one priority for organizations that want to remain ahead in terms of having a comprehensive enterprise GIS for the future. Everything from smartphones to crowdsourced social media feeds are being used to integrate real-time data from the Internet of Things (IoT) directly into a GIS layer stack, where the data is analyzed, visualized, and reintegrated into online applications for use by response agencies and citizens.

Another way GIS is breaking out of its traditional space is by becoming more consumer friendly. Just as data from mobile devices is liberating responders who've been accessing GIS online and from the desktop, this same data is being used to power a new generation of easily accessible applications that tap into the rich science and analytics that only GIS can deliver. A much simpler user experience is now possible for GIS users with the creation of a suite of apps and app builders. iPhones or Android devices can be used to collect geospatial data or explore it visually, anywhere and at any time. Responders in the field can use these apps for data collection or as observational data, which they can then bring directly into an enterprise services environment in the cloud. Field information is immediately input and analyzed.

The next leap in GIS technology and computing is connecting to the vast network of devices providing data in real time. It is the most revolutionary change we have seen since Esri began and brings great opportunity. The more accessible data is, the more important it will be to understand it. And maps are the visual language for understanding the context of data.

Conclusion

The complex problem of these devastating incidents will require a comprehensive solution. These comprehensive plans must be developed collaboratively by all stakeholders. This challenge requires continued efforts in risk reduction, planning, and response operations—Esri provides solutions to support these activities. Organizations can leverage Esri GIS technology to perform data collection, analysis, operations support, and resource coordination. Esri personnel are available to participate in the planning process and assist agencies with their mission objectives.

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Esri, the global market leader in geographic information system (GIS) software, offers the most powerful mapping and spatial analytics technology available.

Since 1969, Esri has helped customers unlock the full potential of data to improve operational and business results. Today, Esri software is deployed in more than 350,000 organizations including the world's largest cities, most national governments, 75 percent of Fortune 500 companies, and more than 7,000 colleges and universities. Esri engineers the most advanced solutions for digital transformation, the Internet of Things (IoT), and location analytics to inform the most authoritative maps in the world.

Visit us at esri.com.

Contact Esri

380 New York Street
Redlands, California 92373-8100 USA

1 800 447 9778
T 909 793 2853
F 909 793 5953
info@esri.com
esri.com

Offices worldwide
esri.com/locations

For more information, visit
go.esri.com/optimize-response-wp.