Responding rapidly and effectively to major incidents

Environment Agency

The Challenge

- Respond quickly and effectively to major incidents

The Benefits

- Rapid appraisals of emergency situations
- Improved public safety
- More effective responses in major incidents
- Standardised, nationwide processes
- Better planning for future events

If there is a serious flood, a prolonged period of drought or a fire, the Environment Agency needs to react quickly to protect people and the environment. Now the organisation is using a suite of ArcGIS solutions to collect, analyse and share information about incidents, as they happen, and respond rapidly and effectively.

The Challenge
The Environment Agency is a Category One responder and works with other emergency services in the UK to help save lives and protect the environment. Every year, the organisation responds to between 20,000 and 50,000 potential incidents, such as floods, drought or water pollution, of which over 40 are typically classed as 'major incidents'.

During the course of 2015 and 2016, there were a series of devastating floods in the North of England, which endangered people's safety, damaged homes and the natural environment and impacted the regional economy. Environment Agency staff visited the affected areas where they took detailed notes and photographs to record and monitor the evolving situation on the ground. However, due to the manual and paper-based approach available at the time, this valuable insight had to be processed and analysed, increasing the time it took to reach the Environment Agency's incident control centres.

The Solution
After the devastating floods, a review of the Environment Agency's mapping capabilities was carried out, which produced a set of recommendations to improve its incident response capabilities. The organisation then engaged Esri UK's Professional Services team and drew on the expertise of an Embedded Product Specialist to help it design and deliver a brand new Incident Management (IM) Portal based on Esri's ArcGIS platform. Nick Jones, Digital Strategy Lead at the Environment Agency said: "Enhancing our existing in house resource by working closely with Esri UK's Professional Services team allowed us to deliver significant improvements, in a very short period of time."

Given the critical role that the new IM Portal was going to play in emergency situations, the Environment Agency asked Esri UK to host and manage its ArcGIS platform in the cloud. "We realised it was more cost effective and simpler to take advantage of Esri UK's Managed Cloud Services than to host the ArcGIS-based solution in-house," Jones says. "For more than two and a half years, Esri UK has hosted ArcGIS Enterprise, kept it up-to-date and ensured its resilience, enabling our team to focus on using the solution to help save lives and protect the environment."

Now, over 2,500 field-based employees use Esri's Collector App for ArcGIS to gather photos, videos, drone footage and flood outlines on their smartphones or tablets. They can upload this data instantly to ArcGIS Online and ArcGIS Enterprise, where it can be viewed by all of the organisation's 10,000 employees. In the Environment Agency's incident control centres, around 500 office-based employees use Esri dashboards to analyse the data from the field, along with third party data from drone operators and the Environment Agency's existing master datasets, historic data and LIDAR.

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Nick Jones, Digital Strategy Lead, Environment Agency

An Esri dashboard provides up-to-the-minute situational information for employees in the Environment Agency's incident control centre

The Benefits

Rapid appraisal of an emergency situation

Employees in the Environment Agency's national incident control centres now receive information from the field, far more quickly, enabling them to make a rapid appraisal of the extent and criticality of major incidents. Essential information is visible on Esri dashboards in seconds, allowing managers to make well-informed, real-time decisions and implement plans more quickly.

Improved public safety

Using the up-to-the-minute information captured with ArcGIS, managers can alert other emergency responders and the general public about emerging situations, as well as improve its planning for future events, to help save lives. In 2019 when a flood defence was breached in Wainfleet, Lincolnshire, following exceptional rainfall, the Environment Agency recorded incident data in Collector App for ArcGIS and this data is now being used to improve the organisation's systems for warning the public about future flood events in the surrounding area.

More effective responses in major incidents

Critically, the information in the IM Portal helps the Environment Agency to allocate the right teams of people and the right equipment to deal with situations appropriately and without delay. While a fire was blazing at a recycling plant near Sunderland in 2018, the Environment Agency collected information about potential water pollution from the water runoff. The organisation could then dispatch or request specialist teams with the right equipment to block drains and soak up oil deposits to prevent pollution entering nearby watercourses.

Standardised, nationwide processes

An added benefit of the IM Portal and the use of mobile ArcGIS tools in the field is that they have created standardised ways of working across the whole of the country. When a huge tidal surge was forecast to hit the country from the east, the Environment Agency was able to dispatch employees to 90 locations from Newcastle to Penzance to collect data. All the information was recorded in the same way and uploaded instantly to the same dashboard for analysis of the emerging situation.

Better planning for future events

All of the information collected is recorded in ArcGIS Enterprise and used to help the Environment Agency anticipate and plan for future events. Flood data is, for example, incorporated into the organisation's flood models to help it improve the accuracy of its flood warning systems. In addition, employees can use time and spatial filters on interactive maps to look back at previous incidents and gather intelligence at a national and local level.

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