The tool enables firefighters to continue working with paper maps in the field while integrating the data into their GIS systems.

The pen is mightier!

Fire Captain with the Santa Barbara Fire Department (California) Michael Hoose has found a solution for quickly capturing and disseminating information during wildland firefighting operations, the Capturx for ArcGIS system, powered by the Anoto digital pen.

Michael Hoose, a fire captain for the Santa Barbara Fire Department, is on the front line of wild fire response throughout the state of California, the county of Santa Barbara and even his own neighbourhood, as was the case during the late season fires of 2008.

A key part of his strategy includes quickly collecting and sharing field information about fast changing fire situations using sophisticated GIS (geographic information system). Those efficiencies recently received a boost with the adoption of Capturx for ArcGIS, which enable teams to collect data on paper maps in the field using digital pens that automatically integrate field data into GIS systems for faster sharing and decisions.

Fire personnel perform pre-fire surveys to determine areas that are defensible or vulnerable and also to locate areas such as hazard areas, water sources, archaeological spots, and safety zones from wildfires. The surveys involve collecting geographic data that will be critical in the protection of citizens, property, and firefighters during the course of battling fires. After the flames have died out, the teams also conduct post-fire surveys to inspect and assess damage and safety impact of fires.

This information is a top priority for incident commanders coordinating firefighting efforts and resources. And data needs to flow easily from the field to the Incident Command Post (ICP) where central resources can be managed and accessed, decisions made, and updated plans and conditions shared back with field crews.

Consequently GIS data collection techniques have to be flexible enough to be used in all scenarios by anyone tasked to gather information. In most cases, this has traditionally meant teams collecting information with pens on incident action plans or paper topo maps.

The downside has been sharing data collected on paper. Crews have to leave the field to drive the paper notes back to the command centres. Once there, the firefighters spend more time relaying field conditions to GIS analysts, who then update the central GIS systems – time that could be spent in the field.

Solution

Captain Hoose had been looking for ways to speed up data collection and improve the efficiency of data sharing during wild fire response. He selected Capturx for ArcGIS, a tool that enables firefighters to continue working reliably and comfortably with paper maps in the field while also automatically integrating data into their GIS systems using an Anoto digital pen.

With Capturx, field maps and layouts are created within ArcGIS: the same way that they are today. When they print maps on ordinary paper using their office printer, the software creates a digital watermark which is printed along with the map information.

When firefighters write on the map with the Anoto digital pen, they not only get normal ink strokes, but they also get their data digitised. Each stroke of the pen on the paper map creates a new feature or red-line annotation which is geospatially referenced and added to the geo-database. When the pen is docked into its USB port on a PC or laptop, the field data automatically appears in ArcGIS.

Since the basic workflow and the form factor of the tools haven't changed, Captain Hoose has been able to quickly deploy Capturx and begin sharing data about wildfires faster. Since it is pen and paper, his team hasn't had expensive equipment to buy, support, or carry into the field.

Once collected with Capturx, the data can be immediately uploaded and shared at all levels of the team, from the Incident Command Post right down to the firefighter in the field.

Capturx also offers automatic redundancy. Important field data is instantly digitised and stored through the pen while also generating a physical paper copy. Unlike mobile computers, if the digital pen is lost during the course of firefighting, teams retain paper copies of the data which can be shared with the Incident Command Post.

The pens are interchangeable among team members and can also easily be replaced at a fraction of the cost of ruggedised mobile computers.

Captain Hoose has been able to improve team decision making – in less time and with fewer resources. He is also able to spend more time and resources fighting fires instead of waiting for paper, manually re-entering data, or tying up the team with supporting expensive mobile computers in unpredictable field situations.

As a next step, Captain Hoose is looking to bring Capturx Forms for Excel into the workflow of fighting fires, with Capturx enabling existing Incident Command System (ICS) forms to quickly capture and collate information into Incident Action Plans (IAP).