

AFAC Conference Development Program

EMSINA Presents – Geospatial Intelligence, proudly sponsored by Fujitsu

On Thursday 7th September, 2017 at AFAC in Sydney, a range of presenters came together to discuss and share their ideas on geospatial intelligence.

Opening Plenary:

Stuart Ellis, CEO AFAC

Stuart reflected back on two presentations from the conference which addressed data driven decision making.

Bart van Leeuwen (Netherlands) mentioned the challenges of the quantity of data that is now available, and how to determine what's useful.

Sabrina Cohen-Hatton (London) – Operational staff arrive, observe and take action, there is no real thought before the "act". The decision making step is where the need for intelligence comes in.

Stuart outlined his Defence experience whereby one of the first questions asked is "what are the intelligence requirements?" People come back with options. He feels currently this might not be the case in the EM space.

AFAC have just released AIIMS 2017. This is an update to AIIMS 4 (2103) where Intelligence was first identified as a standalone and significant function. There is an updated version of the AFAC Strategic Directions (2017-2021). With this release, a significant milestone has been reached in the commitment to enshrining AIIMS into state legislation: Australia is behind in achieving this compared with others such as US, EU etc.

The reality is that in incidents today we have too much information and is vital it is refined into intelligence to support effective decision making. In simple terms, Intelligence is Collect, Process & Organise to support decision making.

Whilst discussing the Intelligence Cycle, Stuart encouraged us to consider how this works for GIS and suggested it may not be quite so simple. Discussion around the various units within the intelligence section, that includes the Mapping Unit, and the importance of the flow of information out from that section to reach the right people at the right time.

Session 1:

Chief Superintendent Peter McKechnie, Manager State Operations Response & Coordination, NSW Rural Fire Service

Elliott Simmons, Manager Geospatial Intelligence, NSW State Emergency Service State Headquarters

Peter began his presentation by outlining the steps that turn raw data to information to intelligence.

- Data: raw facts and figs
- Information: processed but not analysed
- Intelligence: evaluated and analysed to support effective decision making.



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Emergency Management Spatial Information Network Australia

However, who does the analysis, their understanding of what is required e.g. clear understanding of time and space constraints (are we looking hours or days ahead) has a real impact on the process and therefore the value of the intelligence.

The collection of data, especially the danger of looking for latest tools/technology a user can lose sight of the simple solutions e.g. the importance of local knowledge. Also the impact of trust levels and context for the information collected, can lead to second guessing of the information presented.

How intelligence is displayed or disseminated is as important as the analysis. The importance of presenting intelligence in a format that is readily understood by those who need to use it to support decision making – this comes back in part to clear tasking in the first place.

As an incident grows in its requirements the incident management structure expands as per AIIMS – important that the information flow is not disrupted and they are tasked well. A common problem is to separate them off into an intelligence cell (possibly even physically removed) and their operational context can be lost.

Elliott Simmons

In NSW SES, GIS has moved out of IT and into Operations, driven in part by the identification of intelligence in AIIMS 4. Also the change in the terminology of their roles and title from Spatial to Geospatial Intelligence.

Supporting flood operations requires slightly different requirements within intelligence. In NSW, the Modelling and prediction role and Technical advice tend to become a Flood Analyst role. The flood analyst is more likely to be modelling the potential consequence, based on a range of historical flood studies and the predicted river heights from the BOM, rather than “flood modelling.”

This information can be used in an options analysis e.g. options for an inundation risk are different from those for an isolation risk, with some overlap. One role of Technical Advisor at this point is to provide guidance as to what is, or is not, possible in implementing options being considered.

The role of the Mapping Officer is strategic management of geospatial information – coordinating its gathering, analysis and use.

Session 1: Discussion

- Terminology - GIS (G Information S) as opposed to terms such as Location Products, spatial support, geospatial intelligence. Not just a map, highlight a product or a capability.
- Outsource of skills – (Predictive services) Not uncommon in flooding, how would it work in a fire context, who’s accountable for the risk and how do the agencies manage that.
- Relationship between Planning and Intelligence functions.
- Training and the importance on ensuring people are comfortable in the role. Is it on the job v formal training
- Observation that it’s a mistake to think of Intelligence is a sub function of planning. Currently in AIIMS it is seen as a responsibility of the IC until it is separately staffed. And are we simply focussed on filling on org chart, rather than staffing up when is necessary.
- Intelligence Function Outputs – determine what is needed at each level, ground through to State to National.

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Session 2:

Paul Case, Director Public Safety, Fujitsu Australia Limited

Glenn Richardson, Senior Intelligence Analyst, Public Safety, Fujitsu Australia Limited

Paul began by describing the multitude of information sources that are coming to us in our hyperconnected world: internal agency data, streaming devices, external data sources, the Internet of Things (IoT) and Big Data. Technology allows generations of huge volumes of data, with more devices than people.

It is simply no longer possible to manually ingest all of this. And how do we determine what is truth and eliminate the trolls and the outliers. Eg. Social media

It is necessary that raw data is transformed into something useful in order to have context. Data (disorganised)>>Information (organised)>>Intelligence (interpreted, in context)>>Knowledge (actionable) & informed decision making.



Two methods of intelligence gathering were discussed, human and automated. Edge Based Intelligence Gathering is the development of business rules to allow the automated intelligence gathering to occur. It might take a while to build trust from the automated approach. Typical applications for this are social media, video, sensors (IoT). Think outside the box, we trust a fire alarm – if my internet connected fridge could detect external temperatures being too high to be normal, why not trust that?

Traditional methods of data analysis are now becoming prohibitive. With the vast amounts of data we are ingesting, we are spending more time on consuming, rather than on the important analysis. We need to analyse at the edge, and ingest and use only what you need. Leverage edge based gathering to improve on the timeliness of parts of the process.

The Intelligence workflow should be simply – Collect>> Analyst >> Disseminate. It is vital the Intelligence team is directed on what they trying to achieve, otherwise analysts will be guessing. In more detail the cycle becomes Direct >> Collect >> Process >> Analyse >> Disseminate.

Paul discussed a number of use cases: details can be found in his presentation. These emphasised the importance of timeliness requirements of data – near real time, access on demand, time to ingest.

Business processes need to be in place to deal with new technology, and understand the workflow and time requirements across the business. Finally Paul discussed ‘Appreciation Time’, the thinking time between information received and decision made. The more strategically you are operating at, hopefully the more appreciation time you get.

Glen Richardson

A demonstration was provided on the current capability of video analytics; not quite as what is shown in the TV shows, but there are possibilities of detection of fire/smoke using video, rather than any heat sensors.

A further demonstration was shown using a range of technologies such as facial recognition, location data, pattern matching and similar techniques to draw linkages in data – this technology can be used currently to identify fraud or security/police tracking a person of interest.

Fact: 23 minutes is the longest time a human can watch video without being distracted.

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Session 2: Discussion

- Validation of data – trusted sources, definition of business rules around what’s needed to inform the “intelligent” response.
- Business Rules are needed, but limit them, otherwise the focus becomes on them, not the data being ingested. Aim is to get the focus on the analytics.
- The type of tool could have application in the EM space, CAD – repeat calls, risks nearby
- Use of video analytics with satellite data such as hotspots.
- Missing link at this point is between these new tools and existing agency business rules.

Session 3:

Paul Doherty, Senior GIS Technical Solutions Consultant, Public Safety at Eagle technology, New Zealand

Wayne Patterson, Director, NSW Land & Property Information

Paul introduced us to Geospatial Concept of Operations (GeoConOps) <http://arcg.is/1W4ire>

Question - what does a disaster map look like?

- Each agency and jurisdiction will have a different view.
- Incident Map – Different map required at different level i.e. field v briefing map
- Tactical Map – More locally relevant than at state level
- Public Information Map – What are we trying to tell them and what do we need to community to do.



A range of maps are needed for a range of different scenarios and purposes. Intelligence might be created by adding a photo to the map. It’s not always a one map or one “product” fits all. By asking questions, that will help determine what the product should be.

A Disaster Map can also be a decision support tool: e.g. Situational Awareness Viewer. A range of information can be displayed. E.g. Operational priorities, Rapid Damage Assessment, Emergency protection Zones, just to name a few.

Data consistency and schema matching is key and is needed to easily compile data from a range of agencies. Without it, there can any number of flow on effects from that. E.g. Delays to economic or welfare impacts for a community. Most importantly learn from issues for the next time, as a disaster can help improve things into the future.

Paul then shared with us the steps to getting started: within organisation first, then with your partners, then ‘train like you fight’. Within your organisation: be practical, look to what you can achieve now, not just the 5 year dream.

We need to work with our partners: do this to answer questions we cannot answer on our own. This is particularly important as it requires those relationships to be built before the event!

Testing and training are vital - and if the tools are used day to day as well – even better. If people have not seen the technology before they have no idea how to use it or they don’t know if they can trust it. And you don’t want to introduce something new under pressure during a disaster.

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Wayne Patterson:

The FSD Framework is recognised across all jurisdictions – 10 foundation data themes.

Wayne challenged us with a question – are we confident, in each jurisdiction, that we are using a consistent base map, cadastral, POI etc. data from CAD to internal agency to ministerial briefing? If not, how confident can we be in the decisions we are making?

We should be working towards a situation where ESOs have ready access to this data as services, updated in real time. The cost of creating and supporting FSD is significant. Consider, for example, the cost of storage for imagery and elevation data – raster data – and serving it. But this sort of data is vital to ESOs.

Wayne also noted the importance of compliance with standards – we need OCG compliant data feeds. It is also vital that EM GIS managers be involved and participate in their jurisdictions management of FSD.

Session 3: Discussion

- Importance of Simplicity in Maps – too much information and it cannot be processed
- Importance of familiarity to build trust in methods and data
- Partnerships and Collaboration are key
- Make your COP manageable, rather than everything for everyone.

Closing:

- Spatial needs to look at the intel community and the tools they are developing and be informed by that. Look at products for a different view.
- Less is more – It is not always better to have many layers on a map or in a mapping system.
- Focussed direction on what intel is required is the crucial first step.

Thanks to Fujitsu, to all speakers and to everyone for their support. EMSINA and its members hope everyone enjoyed the day and learnt something new.

