

AlertNet Webmap Initiative – New Media Approaches to Mapping Humanitarian Response

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Abstract

Reuters AlertNet provides a web-community environment for the access and sharing of information focused on global humanitarian response scenarios. AlertNet are currently developing ideas that exploit web mapping technology from ESRI in support of the response activities of the humanitarian relief community. A particular feature of the project is the dynamic linking of breaking news features with supporting map resources.

The presentation will provide a brief history of the project, current activities to prove the concepts and future plans towards capacity mapping.

Introduction

Geospatial technology has the potential to enhance humanitarian response in a variety of ways particularly by improving the efficiency and effectiveness of inter- and intra-community communication. Combined with professional new media communication techniques, Web mapping technology could become an invaluable decision making and information management tool for the global humanitarian aid community.

One of the leading new media players in the humanitarian aid sector is AlertNet – a project initiated and supported by the Reuters Foundation, the charitable arm of the Reuters media group. AlertNet provides a web-community environment for the access and sharing of information focused on global humanitarian response scenarios. One of the main contributions of AlertNet is to filter up-to-the minute news items from the Reuters news wire and supply them free of charge to the Non-Government Organisation (NGO) community. In addition to news stories, AlertNet also provides a variety of useful online information tools and services for NGO's and the wider public. These include a suppliers register, country profiles and a Members-only forum for information exchange.

AlertNet are currently developing ideas that exploit web mapping technology from ESRI in support of the response activities of the humanitarian relief community. A particular feature of the project is the dynamic linking of breaking news features with supporting map resources.

This paper outlines some of the history of the project and what current plans and activities are in place. It includes some detail on what we have learned during the project to date and the plans in place to respond to the developing needs of the humanitarian aid community.

The AlertNet community- New media and humanitarian response

In 1997, amidst the boom in web technology and thinking on the creation and sustainability of web communities, Reuters Foundation initiated a project that sought to serve the humanitarian aid community as part of its charitable contribution. This led to the creation of AlertNet – an information service for the NGO community based on the Reuters principles of independence, impartiality, accuracy and speed. This was driven partly by the perception that international response to various humanitarian crises in recent history had suffered from a lack of properly co-ordinated and professionally presented information.

From the outset, AlertNet was designed to be a community-based service, a resource that served the interests of the humanitarian aid community while aiming to improve the creation, flow and sharing of relevant information. This meant that in addition to the public web pages accessible to all (see www.alertnet.org), there would also be a password protected zone for Members-only where sensitive information could be shared in a secure environment free from external influence. Membership would be available only to aid organisations meeting a set of community-agreed criteria and through a process of peer acceptance.

The success of AlertNet is such that in a short space of time, it has become one of the most used and trusted humanitarian information services on the web. The current official AlertNet Membership numbers over 200 and includes major NGO's such as IFRC, Oxfam, CARE International and Medicines Sans Frontieres. Site traffic has increased steadily during its lifetime reaching a peak of 100,000 hits a day during the recent Iraq crisis.

For the future, AlertNet remains committed to providing a useful service to the humanitarian community and developing the range of services that will secure its role as a key humanitarian information channel.

Exploring the role of geospatial information

From an early stage, AlertNet realised the value of geospatial information and that new media techniques could be employed to help improve access to information not normally used by the NGO community. This included a range of mapping resources but initially focused upon Earth observation (EO) data.

Initial surveys of AlertNet Membership indicated that there were many potential uses of EO within the humanitarian response context but that access to the information was difficult and that NGO's did not usually have the time or resource to do much about it. AlertNet teamed up with ESYS plc, a UK based technology and management consultancy firm, to explore the possibilities of using geospatial data and how it might be exploited through AlertNet to the benefit of the Membership.

Early studies were supported by the British National Space Centre and subsequently by the European Commission Joint Research Centre. These studies provided an early indication of user needs and how these could be met through various service concepts. Initially, these studies focused on the use of EO for emergency response purposes, such as rapid mapping of major flood events. Subsequently, in response to Member requirements, the emphasis has been broadened to assess early warning systems (to provide a more comprehensive temporal view of natural disasters) and mapping technology (to provide a better information management and presentation framework).

AlertNet is currently party to a three-year collaboration agreement with the European Space Agency (ESA) to explore more fully the potential for EO and geospatial information technology within the humanitarian aid community. In the first instance, this has produced a specific set of web pages on the AlertNet site devoted to EO resources (see Figure 1). In future however, this will be expanded to include the enhanced services described later in this paper.



Figure 1: ESA Satellite Imagery microsite

What have we learnt?

From the work completed to date, it is worth summarising the current understanding of what information requirements exist and how these can be met with the service concepts being introduced to AlertNet. It is not the purpose of this paper to provide comprehensive technical details but to highlight the lessons learnt and what these have meant in terms of service developments.

- Community information requirements

A set of general statements can be made about the type of information required by AlertNet Members and the factors that affect the nature of the information product to be supplied. At the highest level, since the service is often being provided to a non-technical audience, the information provided must be:

- Timely – delivered within a timescale appropriate to the scenario in question
- Reliable – there must be certain level of confidence attached to the information
- Usable – presented in a jargon-free, usable format.

The characteristics of the required information product are dependent on dimensions of the response scenario. Some of the key factors include:

- Type of emergency – is this a natural disaster or complex emergency?
- Speed of on-set – can range from hours (e.g. flash flooding) to months/years (e.g. famine)
- Phase of emergency – with the main phases including preparedness, response and rehabilitation
- Scale of emergency – is this a local, regional or national issue?
- Response characteristics – ranging from short term response to long term development scenarios.

Comparing the range of issues that NGO's deal with on a regular basis and considering the capabilities of available (and forthcoming) geospatial data, the following types of response scenarios are of interest to AlertNet Members.

- Flooding – particularly large scale events of an unexpected nature (i.e. many flood events are seasonal and local response networks are adequately prepared)
- Tropical storm tracking – with an emphasis on forecasting potential areas of land fall and related impacts
- Famine and food security – monitoring the status of regional and national agricultural capacity
- Health issues – an emerging application area of great interest to medically-focused NGO's
- Refugee camp monitoring and planning – with an emphasis of siting and construction of camps and supporting infrastructure. Some interest in population counts and statistics.
- Major seismic activity – local impacts of major volcanic eruptions and earthquakes are of interest.

In response to each of these scenarios are a range of thematic information products required by Members. Some are static map products; some are dynamic information services.

- **Business processes and functions**

What the project is now trying to understand are the business processes and organisational functions that exist within Member organisations. This is required to understand how information products are used and will help to define how future information products and services should be optimised for Member purposes.

It is interesting to note that there is a different set of requirements within a single organisation depending on whether the end user is involved with logistics and planning tasks as opposed to say marketing activities. Larger NGO's in particular operate like private entities in many ways and different departments will use the same piece of information in various ways.

To illustrate this, consider the case of a large flood event. An image of the size and extent of the flood will help a marketer communicate the message of how important the scenario might be and hence support fund raising efforts. The logistics and planning officer however will use the same information to help decide how best to respond to the emergency. What is also emerging is that such products can act as the unifying framework to assist communication between different functional departments. Very often, it is a map that will be the central focus of discussions involving various representatives, both within organisations and between separate organisations.

- **Service concepts**

There are currently three major service concepts being worked upon by AlertNet as indicated in Figure 2.

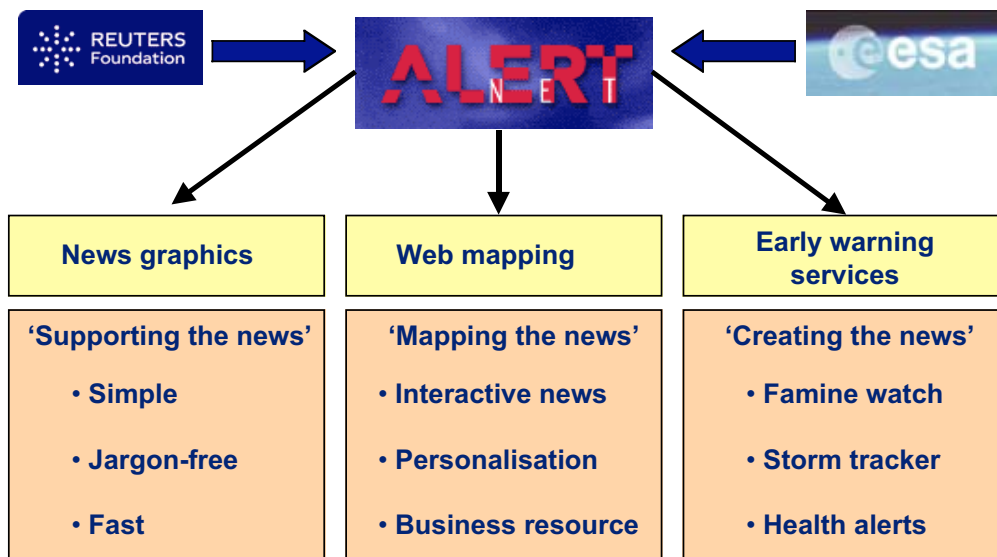


Figure 2: AlertNet geospatial services

- News graphics: 'Supporting the news'

News graphics are the oldest of the service concepts to be tested and used by AlertNet, driven by the need to respond quickly to breaking news events. Most graphics are therefore rapid response products derived mainly from EO products and enhanced by ESYS to provide geographic context and basic explanatory commentary. They meet the criteria of providing information quickly and in a format that is immediately usable and understandable by the non-EO expert. The most common disaster type covered is flooding. A significant number of graphics pertain to slow on-set scenarios such as famine situations.

The sources of such products are currently various websites that provide basic image resources free of charge. These include ESA, NASA, NOAA, FAO FEWS-Net and Dartmouth Flood Observatory to name a few.

- Early warning: 'Creating the news'

A more recent development is the thinking behind early warning services. This is the term given to set of service elements that have in common the objective of providing lead-time before the impact of a disaster. The longer the lead-time, the more prepared a response agency can be. Although this might seem like the Holy Grail of emergency management, there are some small but significant developments that AlertNet sees as a core part of its information service mandate.

Three areas of early warning service are being considered. These include:

- **Storm tracker** – monitoring the development of major tropical storms with the purpose of forecasting landfall. A partnership with a leading authority on storm track forecasting is being explored for this purpose.
- **Famine watch** – monitoring environmentally sensitive regions to aggregate information on developing famine scenarios and food security crises.
- **Health alert** – a significant body of research work is emerging that addresses the health impacts of various environmental conditions that can be monitored and mapped.

None of these services is being developed solely by AlertNet or ESYS. Each involves identifying groups or entities with the right expertise and product and seeing how this can be integrated within AlertNet. The result should be a synergistic set of service layers focused

around the early warning theme. Ideally, Members can then identify themes or areas of interest and ask AlertNet to make them aware when anything of interest is emerging (such as a storm developing in a specific region of interest).

- **Web mapping: 'Mapping the news'**

The third category of AlertNet geospatial services is web mapping. In a sense, this is the unifying service that can provide the framework within which to link all other forms of information. Although a web mapping service that contains the basic required map data layers is desirable, this would not provide anything unique to the AlertNet membership that they cannot obtain elsewhere.

The true value of exploiting web mapping technology within AlertNet is the interaction between different information sources and services combined with the basic map data layers. So for instance, integrating a storm tracking service with population data layers will provide a useful impact analysis tool. Similarly, once a storm has struck, imagery of the resultant flooding can then be built into the system and analysed for different purposes (i.e. response rather than preparedness). What the Membership then obtains is an integrated information environment that helps minimise time spent searching the whole web or other sources.

In addition, the intention is to provide a certain level of personalisation within the service so that NGO's with in-house GIS systems can use the information from AlertNet seamlessly with internal resources.

Finally, there is one key advantage of using the AlertNet environment within which to undertake this project. Linking map information directly to breaking news will help reduce the time between knowledge of a disaster scenario occurring and the acquisition of appropriate mapping resources. Since the Reuters newswire uses an indexing system that allows only relevant news to be extracted by AlertNet, this same system can be used to try and link location information to the right map starting point.

For instance, a breaking news story of a major flood in China will likely be indexed 'flood' and 'China'. This information can be used to automatically generate a map product of China with further intelligence used to identify more local information if available. Furthermore, as expressed earlier, Members could indicate that such an event is of interest and receive automatically generated alerts without having to visit AlertNet.

Many technical and organisational issues have to be solved and this is the purpose of the AlertNet Web Mapping Initiative that began in April 2003.

The AlertNet Web Mapping initiative

AlertNet and ESYS have defined a plan to introduce web mapping capabilities in parallel with other service developments. The plan is to develop the service in two stages. Phase 1 will provide a basic web mapping service with integrated news features, such as the automated generation of a map in response to a particular news item. The lessons learned from Phase 1 will be used to plan and raise funds for a much more comprehensive service in Phase 2. Figure 3 illustrates the differences between the two phases.

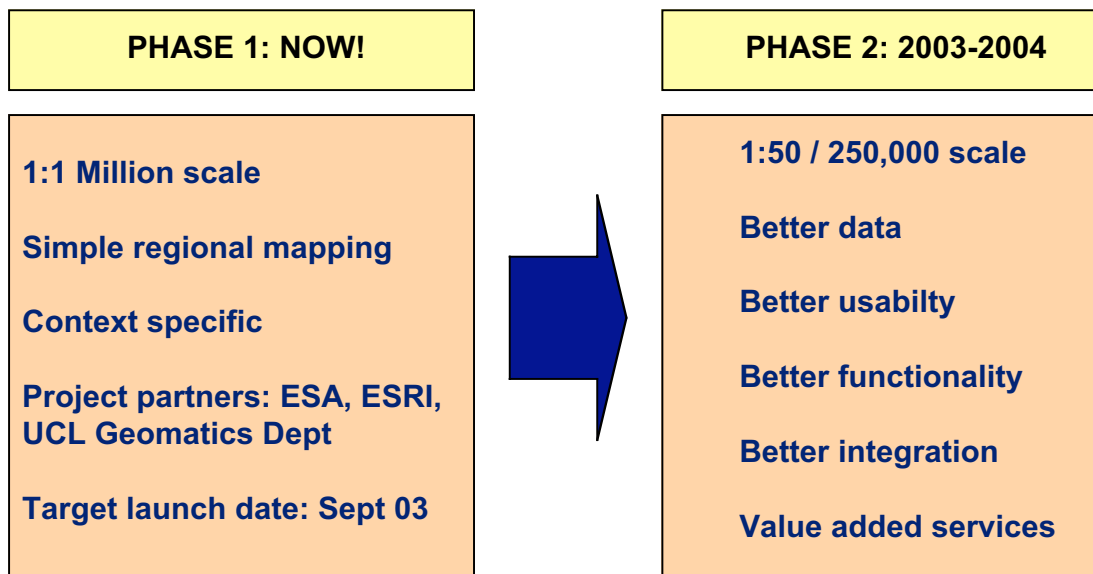


Figure 3: AlertNet Web Mapping Initiative development plan

Phase 1 - Proving the concept

Phase 1 is essentially about proving the concept. One thing learnt in all of the work done to date is that it is too easy to run ahead of the Members ability to learn what is possible. It is more productive to work in a cyclical manner, introducing incrementally new ideas and then learning exactly how useful those ideas are and what new possibilities they throw up. It is usually unproductive to ask 'What services do you want?' since most people simply ask in return 'Well, what can you do for me?'

Hence, Phase 1 will focus on straightforward mapping capabilities using easily and freely available data sources without license restriction. Any development effort will focus on:

- integration with the AlertNet 'look and feel'
- automated links to news stories
- intuitive use for the non-GIS expert

The project is being supported by ESRI since the system will be based on ArcIMS. The project team also includes financial support from ESA and technical support from University College London. Current target launch date is September 2003.

Phase 2 - Towards capacity mapping

As Figure 3 indicates, Phase 2 will involve a much larger effort. Lessons and ideas gained from Phase 1 will be used to justify a fund raising effort to support improvements in service functionality, available data, integration with other services and levels of personalisation.

Data availability is envisaged as being one of the key limiting factors. There simply isn't a lot of good quality map data for vast areas of the developing world where most concerns of AlertNet Members exist. This then will be a major challenge. However, by demonstrating the usefulness of such a system to the Members, we hope to generate enough community support to raise the funds required to solve some of these issues.

Community support is the key factor for the future of the project and hence the approach being suggested here. Ultimately, if the community does not want or need the services being planned, then they will not be pushed forward.

Currently, the long term goal of the web mapping system is to provide what we call 'capacity mapping'. This is the mapping of various emergency response facilities and resources from any number of agencies in any particular location. The success of such a system would depend on high levels of information sharing and this would require a lot of community support and involvement. The impact of successful capacity mapping however could be considerable in terms of efficiency gains and effectiveness of humanitarian response.

Conclusion

No one information system can hope to deliver all the information requirements of the myriad agencies and entities involved in global humanitarian relief. However, the combination of new media thinking and processes with the technical possibilities offered by web mapping and digital geospatial data could make a positive contribution to more effective response efforts in future. AlertNet is at the beginning of an exciting phase of development and the long term prospects are attractive.

The final thing to say is that this is not an exclusive club. AlertNet is very keen to talk to potential new partners from any relevant sector including software providers, service providers or data providers from either the public or private sectors. If you or your organisation could contribute something positive to the concepts outlined in this paper, we would be very pleased to hear from you.

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