The European Union launched Operation Atalanta in December 2008 to disrupt the growing piracy threat off Somalia

Sharing a Common Picture on Piracy

A concentrated multinational presence, coupled with the exploitation of an increasingly diverse range of data, is successfully informing counter-piracy operations in the Indian Ocean and elsewhere. *Daran Scarlett* of Esri UK examines the advances being made and what the future holds

In May 2012, the European Union's anti-piracy taskforce attacked pirate bases in Somalia for the first time. This followed a change in the European Union Naval Force's (EU NAVFOR) mandate by the EU council, giving it the power to target pirate bases on land. Representing another approach in how the international community is tackling the piracy threat, this new tactic joined the sea patrols, improved defences on board commercial vessels and increased the amount of counter-piracy intelligence in the fight against the problem.

It appears to be having the right effect. According to the International Maritime Bureau's (IMB) Piracy Report in July 2012, the number of attacks worldwide fell considerably in the first half of the year, led by a drop in Somali piracy. Though offset by increased attacks elsewhere, this is encouraging progress for the region, given its impact in recent years. In 2011 alone, the One Earth Future Foundation (OEF) estimated the economic cost of Somali piracy to be between $6.6 billion and $6.9 billion (between £4.1 billion and £4.3 billion). While the threat from Somali piracy is far from over – the IMB reported 69 incidents over the same period – success can be linked to a number of factors.

Presence in the region

The international effort to fight piracy has been under way for some time. Since December 2008, the mission of EU NAVFOR's Operation Atalanta has been to contribute to improving maritime security off the coast of Somalia and in the Indian Ocean. Operating in a region of almost 4 million square kilometres, the force covers an area south of the Red Sea, the Gulf of Aden and the western part of the Indian Ocean, including the Seychelles.

A considerable international military naval presence is now in the area, comprising the Combined Maritime Forces (CMF), NATO, and units from China, India, Japan, Russia, Taiwan and others – all committed to counter-piracy, but with varying mandates and mission objectives. All of this comes

at a significant price, with the West's annual cost of fighting piracy in the Gulf of Aden and the western Indian Ocean estimated to be between $150 million and $350 million (between £94 million and £218 million) per annum.

Uplift in understanding

While the naval presence alone has undoubtedly been a significant deterrent, a major development has been the huge uplift in intelligence and information collection on the threat of piracy across the region. From a military perspective, this has engaged a broad range of platforms and approaches more normally applied to a military or insurgent threat.

The commercial maritime community has also been playing an active role through its collection of data on suspected pirate sightings, attacks or attempted boardings – which is collated through organisations such as the IMB – and making it freely available online. This has enabled the community to better understand the location and timing of attacks, and better grasp evolving patterns of activity.

The growth in new media is also offering new sources of information, with reports of pirates using social media such as Facebook and Twitter – Somalia has one of the most developed IT and mobile telecommunications infrastructures in the region. Equally, the same channels can provide a useful source of imagery, videos and text commentary, posted by crews or passengers in transit through these areas.

While it is clear that there is no shortage of data surrounding the piracy threat, a challenge has been to bring it together and to support a common operational picture. A significant obstacle is that much of the data collected resides in individual systems owned by nations or organisations, often in different standards and formats, which has made the timely sharing of a common picture difficult.

Joined-up approach

However, almost all of this information has some common components – a place and time – and this is where geospatial information system (GIS) technology is playing an increasingly crucial role. Already used heavily in the defence and public-safety sectors, GIS provides a platform through which almost any data, regardless of its format or source, can be brought together as a set of layers that are viewable on common maps and charts. This in itself can be a powerful decision-support tool for hard-pressed commanders tasked with deploying limited assets for best effect.

In addition to acting as a hub for disparate information, GIS also enables a range of more detailed spatial analysis to be carried out, delivering new insights. This can include more in-depth understanding of patterns of activity by time of day, month or season, in relation to other environmental factors. By bringing together factors such as weather, sea conditions, shipping type and speed, GIS can help predict how vulnerable individual vessels may be to pirate attack, enabling proactive advice to be issued on their most appropriate routing.

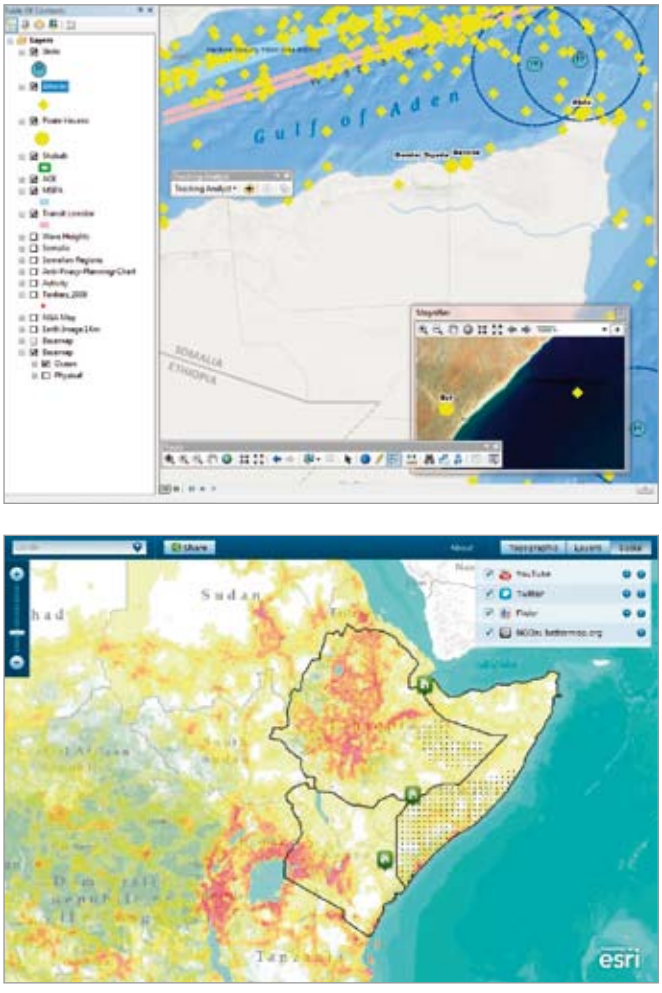
An example of the major contribution that GIS is making towards the counter-piracy effort can be found within European Naval Force Somalia – Operation Atalanta (EU NAVFOR-Atalanta).

The composition of EU NAVFOR changes constantly due to the frequent rotation of units, and it varies according to the monsoon seasons in the Indian Ocean. However, it typically contains between four and seven surface combat vessels (currently supplied by Italy, Germany, France and Spain) and two to three maritime patrol and reconnaissance aircraft. Including land-based personnel, EU NAVFOR consists of around 1,500 military personnel. EU NAVFOR has recently adopted a common geospatial information-sharing platform, which provides a means to join up a wide range of data and intelligence sources to create a single, location-based, recognised, environmental picture.

An improved situational understanding will enable the force to make faster and more informed decisions, and deploy assets more efficiently. When intelligence sources are combined visually, patterns and relationships can be seen, which may not be immediately apparent from analysing each source in isolation. One example is being able to view together, for the first time, data on commercial 'white shipping' and naval taskforce vessels.

The platform, supplied by Esri UK, will act as a hub from which information can be shared and updated between EU NAVFOR's base at Permanent Joint Headquarters in Northwood, UK, and deployed users. Initially they will be afloat, but it is expected that access could be extended to land-based locations or aircraft.

EU NAVFOR's GIS system draws on significant experience gained in support of a similar approach within UK Land Forces. In 2010, Esri UK supported The Joint Aeronautical and Geospatial Organisation's (JAGO) successful deployment of DataMan – a commercial, off-the-shelf geospatial server and access capability in Afghanistan. This GIS system now provides a central, secure server for storing, sharing and exploiting the latest mapping, imagery and geospatial intelligence data. The result is access to a shared common operational picture, allowing decisions to be made by any type of personnel without having to go to multiple systems. DataMan is now receiving up to 2 million hits per month from UK forces and their partners, helping to deploy resources more effectively, plan routes (taking convoys across IED territory for example), determine helicopter landing sites or perform dead-ground analysis.



Screenshots of the Esri GIS platform clearly show maritime and land activity off and on the Horn of Africa

HMS *Cumberland* heads off a suspicious dhow before sending in a Royal Marine boarding team to arrest the pirates and seize their vessel

Although organisations such as EU NAVFOR are showing the potential of such systems in maritime operations, the continued exploitation of geospatial information is not without its challenges.

An adherence to data standards will be a key component to unlocking GIS's full potential, and emerging digital geospatial standards – such as the IHO's new Universal Hydrographic Data Model S-100 – are being designed to facilitate this. Based on the ISO 19100 series, these standards will enable the maritime community to make better use of spatial and temporal analysis with hydrographic data, such as high-density bathymetry, seafloor classification and other marine data in a broad GIS sense. Overall, such a standard will provide the defence community with a much more efficient and versatile standard to include all of the necessary information required in anti-piracy, or other missions in the maritime or littoral context.

Current ship-borne bandwidth and connectivity to send and receive data is another limiting factor, particularly within the naval forces. However, there is an expectation that advances in satellite communications technology, coupled with decreasing costs as competition in this area increases, will overcome this in time.

Improved connectivity will also open up the opportunity for further exploitation of geospatial information, with access to an increasing range of cloud-based, GIS maritime data, plus charts, tools and templates being offered by specialist providers such as Esri.

While the piracy threat is by no means over, it can be seen that the international community is working together to help reduce the number of successful attacks, and in the process it is developing its means to enhance and share its understanding of the problem. Continued collaboration will see the issues of data standards and interoperability being overcome, and advances in communications will, one day, even see real-time information sharing and decision making.

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As seen through the work of bodies such as EU NAVFOR, GIS is emerging as a powerful capability in the fight against piracy. By creating new levels of shared situational understanding, the technology is helping to combat the threat from piracy while deploying costly and limited naval resources more effectively. ■

For further information please contact:
Sarah Webb: swebb@esriuk.com 01296 745500