

Technological Advances and Efforts to Reduce Piracy

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ABSTRACT: The technological contributions to the reduction of piracy not only involve implementations of recent technological advances, but, importantly, the dissemination of the education required to apply current and future technologies, particularly in those states in the regions where piracy is rampant. To this end, the EU's MARSIC project, with the stated aim of enhancing security and safety in the Gulf of Aden and the western Indian Ocean through '...information sharing and capacity building, (and) highlighting regional cooperation' (Marsic 1st monitoring report, 2010) has recently been inaugurated. The Faculty of Maritime Studies and Transport of the University of Ljubljana, and the Maritime University of Szczecin, as partners in this project, will bring to bear both the most advanced technological applications to maritime affairs of satellite imagery, simulation, and risk assessment, and guarantee their utility through the transfer of knowledge. In Yemen and Djibouti, maritime stations will be established, personnel trained, and a sustainable level of expertise eventually left in place. Interest in such projects has also been expressed by maritime experts in Tanzania and Kenya. The advantage this approach has over other donor-supported solutions begins with regional involvement and an inclusive approach, its ultimate success to a large degree dependant on factors external to the project such as financial incentives for the nations of the region to protect European and Far East Asian shipping. The project is closely coordinated with a parallel EU-funded project executed by European Commission's Joint Research Centre (JRC) on maritime surveillance technologies application in the region.

1 INTRODUCTION

One general difference between the social sciences and the physical sciences is that the physical sciences have control of their laboratory and in fact have to determine their own variables. The social sciences are confronted by a plethora of variables that they artificially order for the purposes of study. The current confrontation with piracy poses a challenge for both classes of science. As piracy is endemic in the sea within range of Somalia, the main challenge for the social scientist is in determining how to convert Somalia from its present virtually stateless condition to a viable economic entity that values international law and provides an economic environment in which piracy is no longer a sensible option for its citizens. For the physical sciences, particular those acting at the behest of stakeholders in the global shipping economy, it is a great challenge to approach the problem without considering the challenges typically

restricted to the social sciences. In fact, the case might even be made that the scientific efforts described in this paper place the physical scientist in the position of acting as an ancillary to global policing activities. This, of course, seems to diminish the activities of the scientist; however, it is only another way of saying that science applied in real time to real problems necessarily involves the recognition of the daunting task of striving to create real methods that can be implemented as real solutions at virtually the same time. As an arm of the major economic interests, the scientists who operate in the arena of piracy are disposed to devise methods to counter the threat piracy poses to global shipping, which primarily affects western European, North American, and East Asian economies.

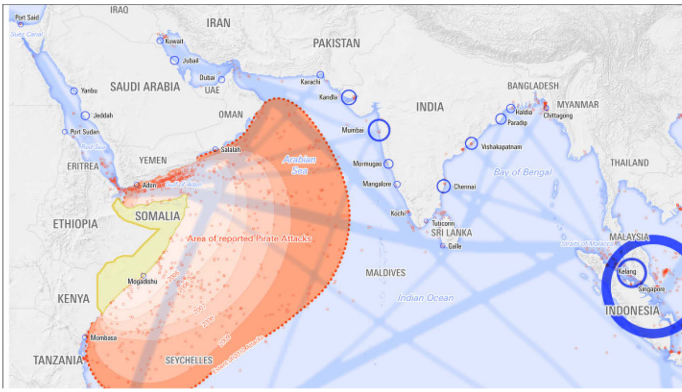


Figure 1: Extent of 2010 Pirate attacks (*Threat Map, 2005-2010*)

The importance of this consideration will be highlighted shortly. First, it should be of benefit to anyone concerned with piracy in the vicinity of the Red Sea, eastern Africa, and the Arabian Sea, to be aware of the point of view of the peoples bordering these waters. The global economic shift that took place once Europeans decisively established themselves as the powers of the Indian Ocean is not viewed passively as an inevitable manifestation of a superior economic system by the people of India, Iran, the Hadramaut, Somalia, Egypt, and so on (*Chaudhuri 1985, Das Gupta 2001, Floor 2006, Hall 1998, Hourani 1995, Braudel, 1995*). In the west we are taught that Vasco da Gama was the first to round the cape of Africa. We are not taught that, in fact, he was the harbinger of massive forced change, disruption to a trade extant for multiple millennia, and eventually the decimation of economies that have yet to recover from the onslaught. Nor are we taught that da Gama himself returned to India a second time and committed atrocities of unimaginable brutality without provocation (*Hall 1998, Harsch 2011*). This is not to say that memories of such depredations linger at the forefront of the minds of those in this region, it is fair to say that this history provides a measure of the context of their thought development.

Focusing specifically on Somalia and Somalians, as the Somalians are the greatest threat to global shipping (among pirates), again the physical scientist would do well to consider some social circumstances. First, as Somalia is without a coast guard or navy of any effect, their extensive waters are subject to extensive pirate fishing. This problem is not limited to Somalia, but extends to all troubled developing coastal countries. According to a report by the Environmental Justice Foundation, "Illegal, unreported and unregulated (IUU) fishing is one of the most serious threats to the future of world fisheries. It is now occurring in virtually all fishing grounds from shallow coastal waters to deep oceans. It is believed to account for a significant proportion of the global catch and to be costing developing countries up to

\$15bn a year." (*Guardian, 2009*). Yet more nefarious is the illegal dumping of hazardous wastes in waters of vulnerable countries: "In 1991, the government of Somalia collapsed. Its nine million people have been teetering on starvation ever since – and the ugliest forces in the Western world have seen this as a great opportunity to steal the country's food supply and dump our nuclear waste in their seas. Yes: nuclear waste. As soon as the government was gone, mysterious European ships started appearing off the coast of Somalia, dumping vast barrels into the ocean. The coastal population began to sicken. At first they suffered strange rashes, nausea and malformed babies. Then, after the 2005 tsunami, hundreds of the dumped and leaking barrels washed up on shore. People began to suffer from radiation sickness, and more than 300 died" (*Hari, 2009*). The point is not to shift the focus from piracy and the need to find methods to reduce its impact, rather to ensure that no one involved in efforts to combat the scourge proceed unaware of a strikingly important aspect of its context. Practically, this means that involvement in such European Commission projects as MARSIC (*Gaullier, 2010*), which plans to open functioning information sharing centers in Djibouti and Yemen, providing advanced training and equipment to these centers designed to be fully operated by local professionals, are aware that, for example, consideration is given to the need to enhance Yemeni and Djibouti economic prospects through this effort, to make this perhaps the first step in including especially Yemen, the poorest of Arab countries, in the global maritime trade complex in such a way that its benefit extend far beyond the fortuitous circumstance of having a port, Aden, in a strategic location.

2 MARSIC

The EU MARSIC program is designed as a step toward improving the safety and security of shipping in the western Indian Ocean and the Gulf of Aden, areas of intensive pirate activities, through the creation of Regional Maritime Institutes (RMI) in the region, including Djibouti, Yemen, Kenya, Tanzania, and other signatory countries of the Djibouti Code of Conduct, which pledges these countries to combat piracy through information sharing on the regional level. MARSIC intends to offer the resources and training to provide these RMIs the latest technology applicable to vessel traffic monitoring, information sharing, and situational analysis based on up-to-date data bases. Merely implementing AIS would be an advancement in most countries, but the challenge addressed by the authors of this paper also include applications of satellite imagery, risk assessment, and the upgrading of legal systems.

Notwithstanding the background of the explosion of piracy in the target areas and the legitimate grievances of peoples of the region, efforts to reduce the instances of piracy and the economic effects of these instances are urgently necessary. One conclusion arrived at both by IMO and the regional littoral countries of the infested areas is that regional involvement is necessary. The MARSIC program intends to support regional efforts in part through the sharing of the most advanced technological aids available. At both the EC-JRC and the University of Ljubljana Faculty of Maritime Studies and Transport the uses of satellite imagery for maritime purposes has been an ongoing project. Advances have been rapid and effective. For instance, it is now, largely through the efforts of scientists at both these institutes, possible to locate oil spills and backtrack towards the identification of illegal polluters (*Perkovic, et al. 2010*), as well as to determine causes and effects that would otherwise be mystifying (*Ferraro, et al. 2010*). One of the frustrating aspects of the constant increase in instances of piracy is that the traditional guardians of commerce at sea, navies, have been unable to reduce the number of instances, even though some 25 ships, assisted by many patrol aircraft and even submarines from about 20 different countries patrol the seas. Satellite technology applications, risk analysis, maritime law, VTS, and maritime communications techniques will all be part of the effort to create effective RMIs in the region.

3 MARITIME DOMAIN AWARENESS

To combat piracy, or in fact any illegal or undesired activity at sea, it is in the first place necessary to be aware of what is going on, and be alerted to threats and problems. Currently, the countries in the Horn of Africa region are either lacking such awareness, financially incapable of contributing to a resolution of the problem, or politically disinclined to do so. This is understandable, as up to now there was no pressing need to invest in an (expensive) maritime surveillance and patrol infrastructure. Now, however, the situation has changed, with, as explained above, not only piracy, but also illegal fishing, waste dumping and trafficking affecting the regional security situation. At present, foreign navies fulfill the task of providing maritime security (within the stringent bounds of international law) and the maritime awareness needed to do so, using the top-level technical means at the disposal of the military. In the long term, however, such a foreign presence is not sustainable or desirable. The challenge is to find ways, technical means, for the national authorities in the region to use in building up their maritime domain awareness by themselves. The Pilot Project on Piracy, Maritime Awareness and Risks, carried out by the JRC, explores this problem (*Greidanus, 2011*).

The project considers a wide variety of sources of information on ship traffic, ranging from cooperative (reporting) systems (LRIT, VMS, AIS, Satellite-AIS (figure 2), VTS, call-in regimes) to observation systems (coastal radar, satellite imaging as VDS – Vessel Detection System presented in figure 3), and assessing the feasibility for operational use by national authorities in the Horn of Africa region and cost-benefit aspects. While the use of reporting systems is in large part related to legal aspects, the challenge for experts in satellite imagery analysis is to overcome technological hurdles, taking into account its particularities, viz. its capability to detect but not identify ships, its ability to survey even the most remote regions but not to continuously monitor, and the delays between the observation of the scene and the delivery of analysis results.

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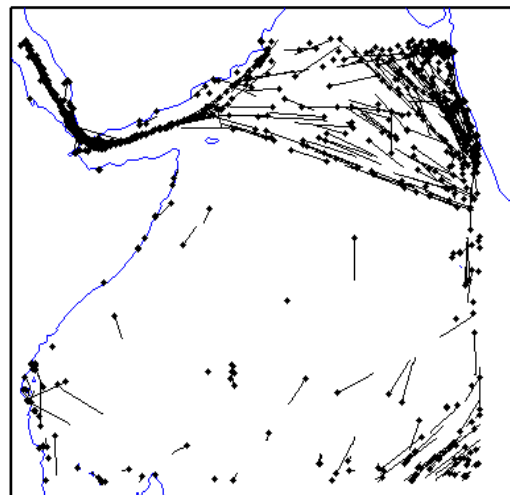


Figure 2: Sat-AIS “ExactEarth” tracks per day. “Result produced by JRC. Includes copyrighted material of exactEarth Ltd. All Rights Reserved.” - 11 Dec 2012

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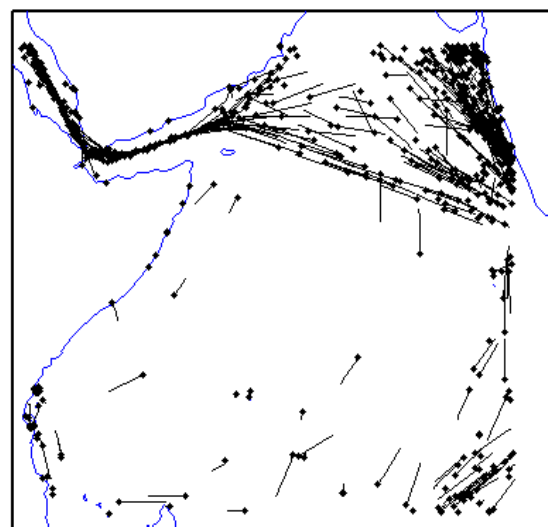


Figure 2: Sat-AIS “ExactEarth” tracks per day. “Result produced by JRC. Includes copyrighted material of exactEarth Ltd. All Rights Reserved.” - 12 Dec. 2010

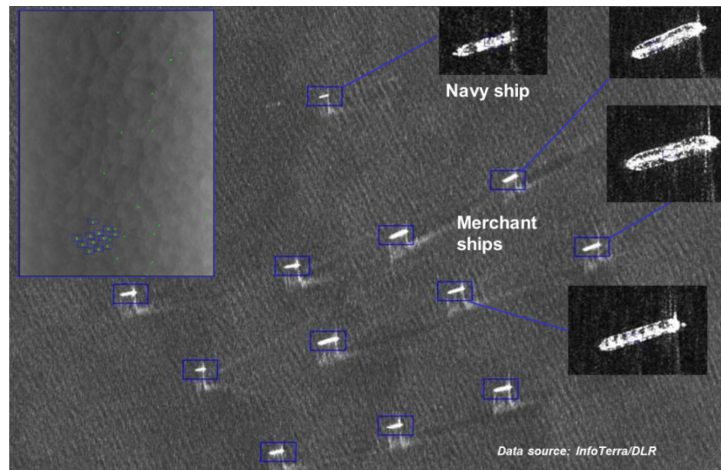


Figure 4: Gulf of Aden, 5 Dec 2010 “TerraSAR-X StripMap -Result produced by JRC. TerraSAR-X image © DLR/Infoterra 2010.”

4 CONCLUSION

Writing just after the so-far-called jasmine revolutions of Tunisia and Egypt, with protests emerging in force across northern Africa and much of Arabia, it is both difficult to imagine the regional circumstances five months from now when the TransNav symposium is held in Gdynia and to view a problem such as piracy in an historic maritime zone such as the Indian Ocean, not to mention the Bab el Mandab, even the Red Sea, without giving thought to extra-scientific matters. Therefore this paper, before introducing the MARSIC and EC-JRC projects, takes time to discuss aspects of piracy that may be relevant and, certainly in the case of the MARSIC project, even decisive regarding the success of the projects. Currently, the MARSIC project’s focus is on the RMI to be established in Sana’a, where volatile protests and counter-protests are occurring daily, while elsewhere in the country, aside from supportive protests in other cities, a vigorous separatist movement is underway.

Certainly both projects, from the social sciences point of view, seem to be on the right track in encouraging regional autonomy. The technology is available, through satellites, AIS, VTS, etc., to at the very least reduce the extent of the problem in the long run. And given current and past circumstances, piracy is least problematically approached by regional stakeholders—the one question being to what extent they believe that they are indeed stakeholders. Certainly cooperation between the countries of the region and Europe (and other developed nations), the sharing of technology and expertise and the financial support on the part of the EC is for the nonce as good a place to start as any.

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