Developing blue economy, addressing maritime insecurities: information sharing for the Atlantic

Policy Brief for Digital Atlantic initiative

Christian Bueger, *University of Copenhagen*

Introduction

In September 2023 regional states met to agree on an agenda for cooperation across the Atlantic Ocean. The result was the first joint statement of 32 Atlantic nations – the Declaration on Atlantic Cooperation emphasizes. The declaration stresses that the "Atlantic Ocean [...] connects us in the face of challenges such as piracy, transnational organized crime, narcotics trafficking, as well as illegal, unreported, and unregulated (IUU) fishing, climate change, natural disasters, pollution, and environmental degradation, which pose a threat to our well-being, livelihoods, and the sustainable ocean economy."[1]

The seven challenges outlined in the declaration are commonly captured under the "maritime safety and security" agenda[2]-- an expression that is, for example, used by the United Nations General Assembly in its annual resolutions on *Oceans and the Law of the Sea*. In its latest 2023 resolution the UN General Assembly noted with concern

> "threats to maritime safety and security, including piracy, armed robbery at sea, smuggling and terrorist acts against shipping, offshore installations and other maritime interests, and the continuing problem of transnational organized crime committed at sea, including illicit traffic in narcotic drugs and psychotropic substances, the smuggling of migrants, trafficking in persons and illicit trafficking in firearms, and noting the deplorable loss of life and adverse impact on international trade, energy security and the global economy resulting from such activities."[3]

Paradoxically, the Partnership for Atlantic Cooperation (PAC) –- the new forum established by the Declaration on Atlantic Cooperation –, however, explicitly excludes "matters related to defense, security, and governance".[4] The same time, the maritime safety and security challenges as defined by the UN General Assembly are vital in "sustainable economic development" (or what is known as the blue economy) that the PAC's Agenda for Action emphasizes.[5]

The link between the blue economy and maritime security has been widely acknowledged, in terms of preventing harm to the environment, creating secure conditions for trade and investments in coastal economies, and the need for maritime law enforcement in this regard. It has been regularly

flagged as a major concern, including in the UN Sustainable Development Goal process for the oceans.

How to deal with this paradox that the main problems identified in the Declaration are in the realm of safety and security, while the PAC does not want to address security? The answer might lie in the PAC's call for "cooperation and interaction on science and technology".[6]

This policy paper investigates how information sharing technology and initiatives, often described with the term of Maritime Domain Awareness (in short MDA), can contribute to the PACs efforts of addressing the seven maritime safety and security challenges outlined in the Declaration. Information sharing can do so without undermining the civil, non-defense character of the PAC.

The paper starts in investigating the contributions that information sharing can make to effective regional ocean governance and in explaining the concept of MDA. The following section explores the range of MDA initiatives that already exist in the region. I highlight some notable gaps that need to be filled and argue for networking the existing networks. The benefits of such an approach are then emphasized by discussing how MDA can make a difference in addressing the seven challenges. The discussion is clustered around shipping risks, critical maritime infrastructure protection and fish crimes where these benefits are particularly visible. The paper ends with six recommendations to consider for the PAC and its member states.

The importance of information sharing and data fusion

To govern the ocean, one needs to know what activities take place at sea. Effective understanding of the sea is the precondition for planning economic development of ocean industries, protecting marine biodiversity, for avoiding multi-use conflicts and accidents between the diverse users of the sea, for identifying behavior that does not comply with the laws of the sea, for detecting blue crimes, and for guiding resource-efficient policing activities. Ocean governance is dependent on solid knowledge of the sea.

Maritime Domain Awareness (MDA)

Knowledge of the sea, however, is often scattered across governmental agencies. Maritime authorities, fishing agencies, port authorities, or coast guards each have a partial view on what happens at sea. They are focused on their specific mandate. Bringing such partial views together on a national level is the first ambition of information sharing and fusion activities.

Yet, most maritime activities are transnational in character – ships under diverse flags move from one port to another, cables and pipelines connect different countries and cross jurisdictions. And so are maritime crimes – illicit fishers navigate the global oceans, and smuggling routes cross regional seas.[7] Thus, no nation can achieve a complete picture of the sea on its own.

One needs to know, for instance, in what shape a ship was when it left the port of another country, if a ship has been caught in non-compliant or even illicit activity before, or if a particular shipment is linked to suspected criminal groups. Also, getting an understanding of what happens outside areas

under national jurisdiction – the high seas – requires inter-state cooperation and exchange of information.

In professional communities such collective information sharing and data fusion structures are often described with the term, Maritime Domain Awareness (MDA). The International Maritime Organization— the UN agency tasked with governing shipping –, for instance, defines MDA as "the effective understanding of anything associated with the maritime domain that could affect the security, safety, economy, or environment."[8]

MDA initiatives aim at fusing data from different sources and sensors, developing shared regional pictures of maritime activities, analyzing these to identify maritime risks, and coordinate operational solutions as well as rapid incident responses across national jurisdictions and the high seas.

A global network of networks

Such efforts are not only costly in terms of gathering data through sensors, such as satellites, organizing and storing data and developing detective algorithms, but also require the input from different states. This is why a global network of initiatives develops MDA for regional seas since the early 2000s. Italy was the first to start such an initiative for the Mediterranean[9], Singapore followed and established an Information Fusion Center for Southeast Asia.[10]

In the 2010s a center for the Indian Ocean region started to be operated by India, the Indian Ocean Commission established a center in Madagascar for the Western Indian Ocean region.[11] The Pacific Island Forum started to operate a Pacific Fusion Center in Vanuatu,[12] while the maritime Information Fusion Centre for Latin America in Peru began to provide such services for the South Pacific. A series of regional issue-specific centers complements the work of these MDA centers and for instance specializes in information sharing on piracy or narcotics smuggling.[13]

While these organizations rely on different legal constructions (treaties, Memoranda of Understandings) and operate their own proprietary information sharing and data fusion platforms, increasingly there is a network of networks and close collaboration among these centers.[14]

While some of the centers are run by navies (e.g. in India and Singapore) others are led by civilian authorities (Madagascar, Vanuatu). In either case, MDA centers quite explicitly do not focus on defense matters. They work on cooperative security solutions, the prevention of blue crimes, marine safety and environmental protection.

In addition to the fusion and analysis of maritime information and providing real-time support for seagoing forces, the centers also issue information products – such as statistics and trend analyses – for regional publics, governments, and industry. Such reports and maps can be important to inform political decision making or educate the public about the importance of the sea and the challenges the oceans are facing.

Often, MDA centers organize multi-national joint training courses or run tabletop and life exercises. This can be important to nurture trust between agencies and industries, to elevate professional skills, to ensure interoperability, but also to identify gaps in responses.

The state of MDA in the Atlantic

How does the Atlantic fit into the evolution of MDA and are there ambitions to develop regional solutions that are comparable to the Indian Ocean or Pacific? The answer is: In the Atlantic we find a patchwork of initiatives, none of which covers the entire ocean, and these tend to be disconnected from the initiatives in the Indian Ocean and Pacific described above. There is moreover a disconnect between the North Atlantic and the South Atlantic.

The regional MDA system is currently made up of five layers: sub-regional MDA initiatives, regional seas conventions, search and rescue structures, coast guard cooperation, and issue-specific initiatives. Table 1 provides an overview of these layers and includes a non-exhaustive list of examples.

Table 1: MDA related initiatives in the Atlantic

	Organization	Area of Interest
Sub-regional initiatives		
Common Information Sharing Environment **(CISE)**	An internal structure within the European Union led by the European Maritime Safety Agency	European waters, broadly defined.
Yaoundé Code of Conduct **(YCOC)**	Structure established as part of counter-piracy efforts as a donor-regional state cooperation	West Africa and Gulf of Guinea
Zone of Peace and Cooperation of the South Atlantic **(ZOPACAS)**	Proposed, incipient	South Atlantic
Arctic and North Atlantic Security and Emergency Preparedness Network **(ARCSAR)**	Information sharing network linked to the Arctic Council	Arctic and North Atlantic
Regional Seas Programmes		
Convention for the Protection of the Marine Environment of the North-East Atlantic **(OSPAR)**	UNEP	Region stretching from Spain and Norway in the East to United States in the West.
Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region (WCR) or **Cartagena Convention**	UNEP	Wider Caribbean
The Convention for Cooperation in the Protection, Management and Development of the Marine and Coastal Environment of the Atlantic Coast of the West and Central Africa Region **(Abidjan Convention)**	UNEP	West and Central Africa, stretching from Senegal to South Africa
Commission for the Conservation of Antarctic Marine Living Resources **(CCAMLR).**	UNEP	Antarctica
Search and Rescue Zones		

Argentina, Brazil, Canada, France, Iceland, Liberia, Norway, Portugal, Senegal, South Africa, United Kingdom and United States.	IMO	Entire Atlantic divided up between states
Agency Forums		
Arctic Coast Guard Forum **(ACGF)**	Informal multi-lateral mechanism	Arctic
North Atlantic Coast Guard Forum **(NACGF)**	Informal multi-lateral mechanism	North-Atlantic
Issue-Specific		
Maritime Analysis and Operations Centre (Narcotics) **MAOC (N)**	MoU-based mechanism of 7 EU Members and UK, with Brazil, Colombia, Senegal as partners	Atlantic
Maritime Domain Awareness for Trade – Gulf of Guinea" **(MDAT GoG)**	UK and France in support of YCoC	Gulf of Guinea

Sub-regional initiatives

As a first layer, a range of sub-regional structures provides MDA. This includes two highly institutionalized forms of MDA: The European Union's Common Information Sharing Environment (CISE) is operated by the European Maritime Safety Agency (EMSA) and focuses on European waters, broadly understood. It is expected to be operative in 2025. In the South Atlantic the Yaoundé Code of Conduct process is the leading MDA initiative for West Africa and the Gulf of Guinea region.

In addition, the Arctic Council as well as the Zone of Peace and Cooperation of the South Atlantic (ZOPACAS) have outlined ambitions for improving information sharing, which has however not directly led to institutional forms. Related initiatives include the U.S. National Maritime Intelligence Integration Office's Maritime Information Sharing Initiative for the South Atlantic that focuses on maritime information, such as crew lists or cargo, and NATO's Digital Ocean Initiative that focuses on critical maritime infrastructure protection in the North Atlantic.

Regional Seas Conventions

A second layer is provided through the conventions established under the Regional Seas Programme administered by the UN Environment Programme (UNEP). These conventions were developed as part of the law of the sea negotiation process to add a regional and eco-system dimension to the UN Convention on the Law of the Sea with a focus on regional cooperation on environmental protection, science and technology transfer and sustainable development. A key focus of regional seas conventions is the sharing of information and cooperation of regional coast guard organizations. In the Atlantic four such conventions are in place covering the North-atlantic, the Caribbean, West and Central Africa and Antarctica.

Search and Rescue

A third layer is the global arrangement on Search and Rescue Zones (SAR) under the auspices of the IMO puts nations in charge of assisting mariners in stress outside of territorial waters. Under these regulations, countries are asked to provide Search and Rescue Centers that coordinate activities in international waters. The largest SAR zone responsibilities in the Atlantic are with Argentina, Brazil, Canada, France, Iceland, Liberia, Norway, Portugal, Senegal, South Africa, United Kingdom and United States.

Agency Forums

A fourth layer is closely related to the Regional Seas conventions. Coast Guard Function forums provide a sustained form of interaction between regional agencies that perform marine safety and law enforcement tasks. Information sharing takes place through forum events at the level of heads of coastguards, but also working groups of technical experts. These working groups work towards improving MDA, for instance, by developing standard operating procedures for information sharing or guidelines for dealing with maritime cyber risks. Two are run in the region: the Arctic Coast Guard Forum and the North Atlantic Coast Guard Forum.

Issue-specific initiatives

A fifth layer is provided by issue specific MDA. These structures and centers focus on a particular maritime risk, paying less attention to how it intersects with others. In the Atlantic there is one initiative based in Portugal that focuses on narcotic smuggling – The MAOC (N), and the MDAT-GOG initiative that focus on piracy in the Gulf of Guinea in support of the YCoC.

Observations

This mapping, firstly, implies that no current mechanisms cover the entire Atlantic Ocean or have the ambition to do so. Yet, there is a patchwork of initiative which indicates that states in the region recognize the importance of information sharing. Secondly, these initiatives are clustered around the Arctic, North-Atlantic and Gulf of Guinea, with less activities visible in the Caribbean and the South Atlantic. This can be seen as a notable gap and the lack of such structures indicates major discrepancies in maritime knowledge.

The benefits of enhancing MDA to address risks and enhance resilience

While MDA is an analytical tool to enhance collaboration for addressing any kind of joined challenges at sea, it is particularly beneficial for addressing and mitigating transnational challenges that affect all coastal states equally. In the following shipping risk mitigation, critical maritime infrastructure protection and the prevention of fish crimes are highlighted as areas that can benefit from enhanced cross-Atlantic MDA.

Shipping Risks

Shipping is the backbone of global trade, yet it entails significant risks to harm the ocean environment. Because shipping operates transnationally across jurisdictions, in the high seas, and sometimes under weakly regulated flag states, shipping risks are often not fully recognized or sufficiently addressed.

In 2022 more than 3,000 incidents were reported, almost 40 ships lost at sea, and seven accidents of oil tankers led to a spillage of 15,000 tons of oil.[15] On average each year more than 1,500 containers are lost at sea,[16] and ship strikes kill more than 20,000 whales.[17] Growing noise pollution from shipping disrupts marine eco-systems. With the ongoing expansion of shipping and the extreme weather and higher waves implied by climate change, these risks become even more concerning. Moreover, the growing range of ships that are engaged in international sanction violations and operate with substandard safety – known as the ghost, shadow or parallel fleet – enhances these risks.

The International Maritime Organization is the main UN agency that regulates shipping and is the guardian of over 50 conventions that address these risks. This includes a compulsory review process of member state legislations and procedures, and technical assistance to countries in need. As two recent reports of the Human Rights Council's Special Rapporteur on hazards have shown shipping risks are insufficiently addressed by the IMO.[18]

Pan-Atlantic MDA could go beyond coordinated search and rescue and move towards pro-active risk assessment and management. Through combined tracking and exchange of port data, MDA could identify and track sub-standard ships, work towards locating and potentially prosecuting unreported incidents (such as accidental spills, or container losses) through satellite data, and enable joined rapid accident and disaster responses by sharing information, for instance, or oil spill contingency capabilities.

Critical Maritime Infrastructure Protection

The Atlantic is not only a region of dense maritime trade, but also a region increasingly interconnected through infrastructure. This includes the trans-continental subsea data cables providing the backbone of contemporary digital communications and the internet.[19] National economies are moreover increasingly connected through energy markets, where underwater pipelines or electricity cables provide regional connectors. The transition to green energy is a shared challenge across the Atlantic. The currently most effective forms of renewable energy are offshore wind and solar farms. These are often located in Exclusive Economic Zones, and hence not under full national jurisdiction, and face a wide range of vulnerabilities, including from cyber risks.[20]

In 2023 the UN General Assembly “urged” all states “in cooperation with the International Maritime Organization and other relevant international organizations and agencies, to improve the protection of offshore installations, submarine cables and pipelines and other critical infrastructure by adopting measures related to the prevention, reporting and investigation of acts of violence against

such infrastructure, in accordance with international law, and by implementing such measures through national legislation to ensure proper and adequate enforcement." [21]

Shared Pan-Atlantic MDA here provides the opportunity to follow up on this call by offering a mechanism to transnationally strengthen prevention, reporting and investigation of incidents, as well as facilitating regional learning.

Fish crimes

Fish continues to be an important source of income and is vital for the food security of coastal populations, as the UN's second World Ocean Assessment has highlighted.[22] The global decline and collapse of fish stocks cause by overfishing, weak regional management, weak fishery control mechanisms, but also by crime, undermine the objectives of the UN Sustainable Development Goals.

Preventing and counter-acting fish crimes, often described as Illegal, Unreported, or Unregulated (IUU) fishing is important, given that it is a significant threat to the populations and economies of the countries of the Atlantic. In particular, the South Atlantic has been identified as a global hot spot for fish crimes.

Moreover, many fishery vessels have been observed to engage in gross human rights violations on board, including conditions of bonded labor and slavery. Fish crimes can also be facilitating crimes, in that the same vessels are engaged in other smuggling operations, or in that they feed official corruption or strengthen transnational criminal networks.

Several international instruments, including the Convention against transnational crime of which UNODC is the guardian, and in particular the port state measures agreement provide important responses. The instruments encourage states to cooperate, including through information sharing.

MDA allows to identify and track vessels engaged in fish crimes. Such vessels operate in the high seas, across jurisdictions, and also often engaged across regions. Recent reports indicate how powerful contemporary MDA tools are in identifying fish crimes.

Recommendations

Advance MDA in the South Atlantic

In the global structure of MDA networks, the South Atlantic has emerged as a blind spot and is the only regional sea that does not currently have a dedicated center. While the Western African regional seas convention provides a partial legal framework, and ZOPACAS has signaled ambitions to improve information sharing, this gap has not been filled so far. This calls for a regional country with the required capacities and resources, including Argentina, Brazil or South Africa to lead on a regional MDA center initiative. Such a center could follow the structures and organizational models established by the IFC Singapore or India's IFC-IOR.

Network the networks in the region

To tackle the challenges outlined in the Atlantic Declaration, including shipping risks, critical maritime infrastructure protection and fish crimes, the Atlantic nations would benefit from developing a shared understanding of the scale and scope of these risks, and sharing best practices of how they can be mitigated through coastal state, port state and flag state measures or initiatives on the high sea. Building effective links between existing mechanisms under the framework of PAC, would allow networking the networks. Since centers tend to work with bespoke systems and are likely to continue to do so given concerns over privacy and security classifications, center can work towards shared classifications concerning risks, and exchange experiences with threat detection algorithms.

Organize exercises

A practical step into this direction are information sharing exercises in which partners can test their abilities to collaborate including in crisis situations, such as oil spills or acts of sabotage on critical maritime infrastructures. Exercises can also enhance mutual trust and understanding between coast guard function agencies and build interpersonal relationships. Exercises, such as those carried out by the IFC Singapore or in the MASE structure can serve as a role model.

Assess national MDA capabilities

To function effectively, Atlantic nations need to have national MDA structures in place that can feed information on events and movements in the waters under their jurisdiction and ships flagged to them into regional processes. An assessment of the state of MDA and the current gaps is required to identify how these can be filled through technical assistance or (sub-)regional cooperation and partnership agreements.

Work towards sustained interaction through forums

One way of how to organize regular exercises and strengthen the links in the network of networks is by developing sustained interaction and communities of practice through the establishment of forums. This could take the format of a PAC working group of country experts on maritime safety and security with a focus as laid out in the UN General Assembly annual resolutions. It could also take the format of an Atlantic Coast Guard Functions Forum that meets regularly under rotating chairmanship and secretariat with operational agencies participating. Integrating knowledge partners, such as the Policy Center for the New South, based in Morocco, or the Portuguese Atlantic Center could assist in establishing such processes.

Think ahead: Opportunities of the new UN treaty

Finally, the recent adoption of the UN treaty on areas beyond national jurisdiction, once ratified, opens up new opportunities for the Atlantic nations to protect their marine environments. The treaty allows for the implementation of area-based management tools on the high seas. This could provide the opportunity for the Atlantic states to jointly monitor and protected parts of the international waters of the Atlantic.

Biography

Christian Bueger is professor of international relations at the University of Copenhagen, one of the directors of SafeSeas – the network for maritime security and a research fellow at the United Nations Institute for Disarmament Research (UNIDIR). He is the author of Understanding Maritime Security (with Tim Edmunds) published with Oxford University Press (2024). Further information is available on his personal website at www.bueger.info He can be contacted at Christian.bueger@ifs.ku.dk

Endnotes

[1] The White House. 2023. Declaration on Atlantic Cooperation, September 18, 2023, available at https://www.whitehouse.gov/briefing-room/statements-releases/2023/09/18/declaration-on-atlantic-cooperation/
[2] Christian Bueger and Timothy Edmunds. 2024. *Understanding Maritime Security.* Oxford: Oxford University Press.
[3] On 5 December 2023, the United Nations General Assembly (UNGA) adopted Resolution 78/69: Oceans and the law of the sea with a vote (140-1-3).
[4] Ibid.
[5] Ibid.
[6] Ibid.
[7] See Bueger, Christian and Timothy Edmunds, Understanding Maritime Security, Oxford: Oxford University Press, 2024, chapter 5.
[8] See the discussion in Christian Bueger, From Dusk to Dawn? Maritime Domain Awareness in Southeast Asia, Contemporary Southeast Asia 17(2): 157-182, 2015, doi: 10.1355/cs37-2a,
[9] Christian Bueger, Building Global Maritime Domain Awareness: What are the next steps?, in Annual Report of the Trans-Regional Maritime Network 2022, Italian Navy, Rome, 4-8.
[10] See Paving the Way for Regional Maritime Domain Awareness, eds. Christian Bueger and Jane Chan. Singapore: S. Rajaratnam School of International Studies, Nanyang Technical University Singapore, 2019, available at https://www.ifc.org.sg/ifc2web/Publications/Professional%20Reading/Regional%20MDA/Chapter%201.pdf
[11] Christian Bueger, Effective Maritime Domain Awareness in the Western Indian Ocean. Policy Brief 104, June 2017, Institute for Security Studies: Pretoria, https://issafrica.org/research/policy-brief/effective-maritime-domain-awareness-in-the-western-indian-ocean
[12] https://www.pacificfusioncentre.org/ and the discussion in David Brewster, The Pacific Fusion centre. The challenge of sharing information and intelligence in the Pacific. ASPI Special Report, 2021; and Anthony Bergin, A new regional maritime confidence building measure: the Indo-Pacific Maritime Law Enforcement Centre, Australian Journal of Maritime & Ocean Affairs 13:3, 150-156, 2021;
[13] Including the Regional Cooperation Agreement on Combating Piracy and Armed Robbery against Ships in Asia Information Sharing Centre (ReCAAP)

[14] The Italian navy for instance regularly convenes meetings of regional and national MDA centers, and also the UN Office on Drugs and Crimes has developed a similar initiative with a focus on the Asia-Pacific.
[15] Allianz (2022). Safety and Shipping Review 2022. Munich.
[16] Allianz (2022). Safety and Shipping Review 2022. Munich.
[17] Fitzner, Zach (2021). Thousands of whales are killed by ship strikes each year. Earth.com, available at https://www.earth.com/news/thousands-of-whales-are-killed-by-ship-strikes-each-year/
[18] See https://www.ohchr.org/en/special-procedures/sr-toxics-and-human-rights
[19] See Christian Bueger and Tobias Liebetrau, Maritime Security in the Atlantic: the Vulnerabilities of Subsea Data Infrastructure, in: Shifts in World Geopolitics: Cooperation and Competition in the Atlantic, Portuguese Ministry of Defense, Atlantic Center for Defence Capacity Building, IDN E-Briefing Papers | May 2022, 34-42, https://www.defesa.gov.pt/pt/pdefesa/ac/pub/acpubs/Documents/IDN_E-briefing-Paper_MAI22.pdf
[20] See Christian Bueger and Tim Edmunds, Maritime security and the wind: Exploring threats and risks to renewable energy infrastructures offshore, Ocean Yearbook 39, 465-488, 2024
[21] United Nations. Oceans and the law of the sea: oceans and the law of the sea. Resolution adopted by the General Assembly on 5 December 2023. United Nations General Assembly Document A/RES/78/69, 2023, para 147.
[22] https://www.un.org/regularprocess/woa2launch