

An aerial photograph of a large maritime patrol formation in the open ocean. The formation consists of numerous ships, including several large oil tankers and smaller patrol vessels, arranged in a grid-like pattern. A prominent white wake is visible in the center of the formation, extending from the foreground towards the horizon. The sky is a clear, light blue with some wispy clouds.

SECURE OCEANS

**Collaborative Policy and Technology Recommendations
for the World's Largest Crime Scene**

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The pillage of the seas represents a threat to vital U.S. and global economic and security interests.

A Moment of Opportunity for Ocean Security

Later this year, the United States Secretary of State, John Kerry, will welcome leaders from all around the world to a conference focused on the security of our oceans. High on the agenda is safeguarding marine protected areas (MPA) and addressing the growing threat posed by illegal fishing. The Stimson Center has a long track record of identifying policy and capacity building solutions for issues that have serious implications for our environment, global economic development and U.S. and global security. In the last few years, Stimson has researched and analyzed oceans as the world's largest crime scene and identified a wide range of policy opportunities to increase ocean security, particularly focused on combating illegal fishing. We have also examined the role of technology as a tool to keep our oceans safe.

Today is World Oceans Day and in anticipation of the Our Ocean Conference taking place in September, we are releasing a first set of public policy and technology recommendations. This brief report is a snapshot of a broader and evolving body of work aimed at safeguarding our oceans and combating a wide range of natural resource crimes and challenges.



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Ocean Security: A Multi-faceted Challenge

In 2010, governments around the world agreed to protect 10 percent of the world's oceans by 2020. Today, only two percent of our oceans are recognized as MPAs and a robust enforcement regime, resources and well-functioning partnerships are largely missing.

Ocean security is important for conservation, but reasons for conserving our natural maritime heritage go far beyond its breathtaking splendor and endangered species. About one billion people rely on the world's oceans for fish as their primary source of animal protein. An estimated 880 million people rely on it directly and indirectly for their livelihoods. Rising economic powers such as China have seen fish consumption rates increase 6 percent annually on average since 1990. As fishing fleets deplete stocks and expand operations to every corner of the ocean, global demand for their catch only continues to grow alongside increasing populations worldwide. Some estimates even indicate that local and commercial fish populations have been cut in half since 1970 and countries like China worry that a shortage of fish could trigger societal instability among its growing population. This is one of the reasons why Beijing is heavily subsidizing its 2000-strong distant-water fishing fleet — the largest in the world — that is often found exploiting rich fishing grounds around the world.

There is also a growing body of evidence suggesting that our oceans are the world's largest crime scene due to rampant illegal fishing that is estimated to represent 20 percent of all catch worldwide and represent a yearly dollar value upwards of \$23 billion. Indeed, the pillage of the seas' resources represents a threat to vital U.S. and global economic and security interests.

Already in 2011, the United Nations implicated fishing vessels in the trafficking of drugs, arms, and persons — transnational crimes recognized as threats to U.S. national security. In March of this year, the Australian Navy intercepted a fishing vessel off the coast of Oman with approximately \$2 million worth of arms hidden under fishing nets. It was believed that the catch — seized under authorities mandated by a UN arms embargo against Somalia — originated from Iran.

Additionally, conflict over fishing grounds in Southeast Asia is escalating in a region many see as on the verge of serious armed conflict. For example, Indonesia has blown up over 170 foreign fishing boats caught illegally fishing in its waters over the past two years. Nearly 5,000 Chinese vessels have been apprehended fishing illegally in South Korean waters. Although the Chinese navy has only been involved to a limited extent, some fishing ports have increased their “maritime militias,” or armed civilian vessels.

Finally, *New York Times* journalist Ian Urbina has exposed the extent to which forced and child labor are rampant throughout the fishing industries in Southeast Asia.

In short, there are conservation, geo-strategic, economic development and U.S. national and global security reasons to make our oceans safer and to fight crimes

on the seas. In that spirit, thousands of MPAs have been established in recent years. This is a positive trend that reflects a greater awareness about how the world's oceans and their finite resources impact global affairs. Some reserves are huge, like the United Kingdom's Pitcairn Islands Marine Reserve, which measures three-and-a-half times the size of the UK itself. However, the majority of these MPAs are much smaller. Large or small, they have one thing in common: they're extraordinarily difficult to enforce.

Innovative and integrated policy and technological solutions are critical to amplify, accelerate and strengthen the global response to protecting our oceans. In anticipation of the Our Oceans Conference, the Stimson Center offers the following policy and technology enforcement recommendations to kick-start the conversation ahead of this fall's gathering.

Policy Recommendations

Mapping global enforcement efforts

It comes as no surprise to those involved in working to create and increase security on the seas that there are comparatively few enforcement programs for MPAs in contrast to other maritime security challenges — including those focusing on countering piracy, weapons of mass destruction proliferation, terrorism and the illicit drug, arms and human trades. Those programs that do exist are many times disorganized within and between governments and multilateral organizations. Together these aspects result in a weak MPA enforcement regime with insufficient initiatives and tools.

Furthermore, it is not uncommon that national and multilateral policy is generated in a vacuum without a robust plan of action on financing for enforcement. In deliberations with one major donor government, Stimson learned that the country had stopped funding non-governmental initiatives aimed at establishing MPAs altogether because of a lack of local buy-in and long term plans to enforce the MPA after its establishment.

That policy communities pay more attention to policy development and less on implementation and sustainability is not a challenge only for the ocean conservation community. It is an issue felt in most policy areas, but particularly problematic for less prioritized issue areas where enforcement resources are scarce and the connections to other transnational security challenges are poorly developed.

Part of the antidote to this challenge is to achieve a better understanding of enforcement opportunities and available tools in order to raise awareness and assist governments with pairing their existing resources to where the needs are greatest. This process will require work on both the political and practical level. Low hanging fruit, however, includes continuous efforts to map the global enforcement landscape for MPAs. Information on who is building what type

QUICK FACTS ABOUT OCEAN SECURITY

- Illegal fishing is estimated to represent 20 percent of all catch worldwide for an annual value of upwards of \$23 billion
- The UN has implicated fishing vessels in the trafficking of drugs, arms, and persons, which are transnational crimes recognized as threats to U.S. national security.
- Using fishing vessels to traffic cocaine between the US and Mexico is “modus operandi” and integral to the drug trade
- Vessels that are blacklisted for illegal fishing activity are intercepted only 25 percent of the time
- About one billion people rely on the world’s oceans for fish as their primary source of animal protein.
- Fisheries supply over 260 million jobs around the world.
- Up to 26 million tons of fish are illegally caught each year
- Developing countries are most at risk from illegal fishing, with total estimated catches in West Africa being 40 percent higher than reported catches.
- 4 percent of all Laotian children end up trafficked into the fishing industry
- 53 percent of the world’s fisheries are fully exploited, and 32 percent are overexploited

Photo: Cassandra Thompson, USN





of capacity, where and with whom is invaluable for governments, multilaterals, NGOs and private sector partners in understanding where and how to contribute to MPA enforcement without duplicating efforts.

Leverage broader maritime security capacity building assistance from the defense and security community

It is essential to leverage defense and security resources to safeguard MPAs because there are simply not enough resources in the broader environmental community to manage MPA enforcement and mount an effective response to combat illegal fishing. This does not mean that environmental organizations should leave this responsibility entirely to the world's militaries, which in many instances are also facing budget cuts and pressure to do more with less. Instead, there are opportunities for collaboration.

For example, many maritime security and capacity building programs led by defense and security actors have the capacity to readily service MPA enforcement efforts, but are unable to do so because MPA enforcement or combating illegal fishing are not within their program's mandate or are included very low on a long list of priorities. Updating existing mandates to include or prioritize these issues is a relatively easy win-win fix that can be addressed quickly and subsequently release unprecedented financial, technical and human resources for MPA enforcement, while providing broader stability on the world's oceans.

Leverage broader maritime security capacity building assistance from multilateral organizations

Many multilateral organizations that could play impactful roles in safeguarding MPAs stop short of including MPA enforcement and fish crime in their mandates. A great example of this is the Africa Integrated Maritime Strategy for 2050. The strategy was launched in 2014 and focuses on security and economic development of Africa's oceans, but includes nearly no mention of ocean conservation beyond preventing illegal toxic waste dumping. Considering the long term nature of the plan it is essential that MPA enforcement is included in this and similar agendas around the world. Otherwise, the custodians of these strategies will not be able to direct resources to MPA enforcement in the decades to come.

Similarly, many programs run by the International Maritime Organization (IMO) could easily be expanded to include MPA enforcement. For example, IMO's "Table Top Exercises," which IMO launched in 2012 in partnership with the government of Norway, are simulations for maritime security that bring together all of the relevant governmental bodies within a country (coast guards, navies, port authorities, customs and border agencies) to determine gaps or overlap in response to maritime security threats, and provide technical assistance to resolve them. This type of exercise would be a very interesting opportunity to examine and refine a whole-of-government approach to MPA enforcement in a target country, and

could bring to the table officials from beyond the security infrastructure to include conservation experts and relevant development bodies as well.

South-south cooperation

While the large majority of capacity building assistance comes from developed countries, seizing on effective partnerships between developing nations is critical to enforcing MPAs and combating illegal fishing. Brazil, for example, has been engaged in extensive maritime capacity building in several countries in West Africa since 2003. Through bilateral defense agreements with individual countries, Brazil provides naval trainings with joint exercises and officer trainings in Brazilian naval academies and bolsters maritime surveillance through donations of coast guard boats and aircraft. These trainings and equipment undoubtedly enhance countries' abilities to protect their MPAs. Furthermore, although these agreements operate under the guise of strictly defense, Brazil is known for advancing and advocating for the integration of security and development. This, and the fact that Brazil is in the midst of launching its own \$4 billion maritime surveillance program (Blue Amazon, to monitor, surveil and control its own EEZ) heighten the potential for Brazil's south-south programs to pioneer the inclusion of MPA safeguarding and combating fish crimes into traditional defense agreements.

India is also a burgeoning donor in providing capacity building assistance to small countries in the Indian Ocean — Mauritius, Seychelles, Sri Lanka and the Maldives — since 2004. To help build the maritime domain awareness of these countries, India has donated large amounts of equipment — patrol boats, surface platforms, helicopters — and has gone so far as to install coastal radars for Seychelles, the Maldives and Myanmar (which is slowly starting to receive some assistance as international sanctions lessen). India is emerging as a major donor for these smaller countries in the region and has clearly identified the paramount need for maritime surveillance assistance that directly benefits enforcement of MPAs and against all manner of fish crime.

South-south partnerships come with a wide range of advantages and these opportunities are too often not captured appropriately nor weighed heavily enough when strategizing about building a more robust enforcement regime against global challenges. For example, emerging economies have a more advanced understanding of the value of their natural resources as tools for national and regional development, but lack the resources to take sufficient action. South-south partnerships also tend to be more malleable and reflect a broader mix of soft and hard security challenges, which are often better understood to be interlinked in developing economies.

Non-traditional partnerships

Enforcement systems set up by a consortium of actors are increasing as a form of engagement to improve MPA enforcement, and show high levels of sustainability. Particularly strong partnerships are those led by nonprofit organizations and



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governments with implementation support by private sector companies. Fish-i-Africa is one such partnership that is supported by the nonprofit Pew Charitable Trusts with the government support of the seven participating nations (Comoros, Kenya, Madagascar, Mauritius, Mozambique, Seychelles, and Tanzania) and the African Union, and implemented by the private sector companies Fish Analytical Capacity Tank (FACT) and Nordenfeldske Development Services. The program consists of technical collaboration and real time information sharing and has already won some large prosecutions against fish criminals in its first two years, bringing in over \$3 million in fines since launching in 2013, that speak to the success of the model.

Other examples of emerging, unique partnerships include those for new technological solutions for MPA enforcement and to combat illegal fishing. Currently there are two — Global Fishing Watch and Project Eyes on the Sea — that are both deploying satellite technology for maritime surveillance with support from a private sector partner, Google and Satellite Applications Catapult, respectively, and from conservation nonprofits, Oceana and Pew Charitable Trusts, respectively.

Despite these few interesting new partnership models, the majority of existing partnership programs are rarely integrated, particularly when it comes to the sector they work in. Even when NGOs, multilateral organizations and governments work together they are often streamlined into exclusively handling only environment and development or only security and defense. NGOs have some programs that combine conservation with development, but rarely move into the security area. Private sector companies and, to a lesser extent, governments seem to focus only on security with few if any considerations of environment, and only indirect ones with development. Finding opportunities to forge programs that leverage the resources of a variety of actors and that merge conservation, security and development sectors will be key to managing hybrid, integrated issues such as MPA enforcement.

The private sector needs help

Accessing the vast resources of the private sector is a key force multiplying opportunity for MPA enforcement. Many times technology and infrastructure sectors have the requisite goods and services to make significant enforcement contributions with off-the-shelf products. Moreover, these sectors are often eager to find new markets and business opportunities, especially those that combine their business interests with their goals for corporate social responsibility. For example, Raytheon, Saab Defense and Lockheed Martin all have robust, field-tested maritime surveillance programs and situational awareness technology which they have built for the U.S. and other militaries. These programs will need very little — if any — retooling or updating for enforcement of MPAs or of EEZs against fish crimes, and particularly so when compared to the cost of creating

something entirely new that specifically focuses on MPA enforcement. Finding new value for technology that already exists is one of the greatest opportunities the technology and innovation community has to impact MPA enforcement, and they need help in shaping that conversation.

Technology companies in particular need assistance with understanding the political and policy landscape of MPA enforcement and recognizing how their technology and services can specifically work to further the mission. Companies also need assistance in building innovative financing mechanisms and understanding the medium to long-term business case for getting involved in non-traditional issues such as protecting MPAs.

An expanded role for NGOs

Activities from the NGO community are primarily focused on creating MPAs, raising awareness, and building capacity at the community level by sharing information on MPA regulations and providing alternative means for economic development other than fishing. These approaches hope for a “trickle up” effect to prevent illegal fishing in MPAs, and can be all “carrot” with no “stick”. Unfortunately, the challenges of illegal fishing greatly surpass that which can be mitigated through such a “trickle up” attempt, particularly when perpetrators are not from the local communities, as is often the case in illegal fishing. While NGOs may be playing the long-game for cultural and social change as it relates to MPA protection and fisheries management, they need support in the short term in the form of stronger and more direct enforcement action.

To that end, NGOs hope that governments and multilateral actors will take this assertive enforcement action role. While there are some emerging enforcement partnerships that include NGOs focusing on MPA enforcement, the great majority of NGOs are doing non-enforcement work, as explained above, or are currently struggling to initiate effective enforcement programming.

Technology Recommendations

Technology is playing a large role in developing strategy to combat illegal fishing and safeguard MPAs. Many innovative and unique technologies have arisen to meet the challenge of illegal fishing — from satellite technology and “smart” buoys, to unmanned surface vessels and aerial vehicles (drones). Yet, despite much energy around creating technology to combat crimes on the seas, there are some key takeaways about this burgeoning space that if applied would help skyrocket its real and immediate impact on ocean protection.

Everyone is innovating, but few are integrating

There is no shortage of technological solutions to enforce the maritime domain. Marine enforcement technology for maritime domain awareness, monitoring,

control and surveillance and conservation purposes more broadly has exploded over the last few decades. So much so, in fact, that the technology itself is outpacing our ability to successfully integrate it into MPA enforcement systems. The gap is not one of technology innovation, but rather of integration. In the years to come, the force multiplier will be to integrate satellite data with mobile technology, unmanned systems, radars, enforcement buoys and the like to protect a given MPA. As such, the guiding principle is innovation through integration and finding new value for what already exists.

Surveillance is not deterrence

Deterrence, the act of preventing a particular act or behavior from happening, is critical to the success of any enforcement system. For deterrence to work, it requires a number of ingredients, including defined rules of law, tools for monitoring lawbreakers, and credible threats of interception and prosecution.

The conservation and development communities have long struggled with implementing effective deterrence to protect MPAs, often citing operating environments with low capacity and high corruption as key challenges. However, the main problem is not that of the operating environment, it is a misunderstanding of the tools needed for successful deterrence. Surveillance technology, the category into which most MPA enforcement technology falls, including satellite imagery, acoustic sensors, and onboard observation technology, does not alone create deterrence. It must be accompanied with enforcement technology - tools for interception and prosecution - to effectively deter criminals.

Work with what you've got, not with what you want

Technology is only as good as its user, a fact on display in many MPA enforcement technology projects that have tried, and failed, to implement advanced technology for oceans protection. All too often, these technology projects fail to evaluate the existing technological capabilities of a given MPA enforcement system which results in the transmission of technology ill-suited to the realities on the ground.

Instead of deploying the most advanced technological solutions - underwater drones, high definition satellite imagery and top of the line aircraft - to protect MPAs, capacity builders must engage in bottom up approaches that meet users where they are, technologically speaking.

For an MPA with limited resources and personnel, the first step in increasing the capacity of rangers to enforce the MPA may be a simple mobile app to download on their cell phones into which they can track their patrols, any sightings of unregistered vessels and fish population data, for example. While simpler technology than drones and radars, customized solutions that build on existing levels of capacity lay the groundwork for robust technological systems without requiring huge investments of resources or training for the rangers. "Low tech,"

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bottom up technology holds the key to gradually and sustainably building capacity from the ground up to protect MPAs.

Find honest technology brokers

The world is seemingly at the precipice of a new era of safeguarding MPAs and combating illegal fishing. This era, however, will consist of a long journey to reach our goals for oceans protection and MPA enforcement. Yet too many technology projects are led or influenced by short term support dictated by election cycles, donor support or private sector companies with outdated business models. Technology plans are often designed for short term fixes instead of longer term solutions without interoperability in mind. Part of the solution to this challenge is to identify professionals who understand sensor fusion and longer term technology integration. They exist at universities around the world and are excellent honest technology brokers when designing and deploying technology projects that can outlive their makers.

Technology needs to be multi-use

To avoid duplication of efforts and be successfully integrated into the existing enforcement systems of a given country, technology for MPA enforcement must be able to be used for multiple purposes. Multi-use technology saves resources and increases partnerships and buy-in from adjacent communities. In countries with piracy or human and drug maritime smuggling operations, technology that combats illegal fishing must also be connected to and used for combating these additional threats. In those gathering meteorological data, enforcement buoys can double as observation buoys that gather and report information on water temperature. Technology that can be customized to serve multiple uses is much more valuable than “silver bullet” technology that is designed to only do one specific task.

Making the wrong conclusion from “failure”

Some technology projects in the illegal fishing world are failing. Yet within those failures are important lessons. In the technology world, these attempts would be called prototyping or a step toward success, in which failure, to some degree, is expected. Relatively new to technology, however, the oceans community is struggling to come to the right conclusions about their technology failures, and is missing opportunities to learn and share lessons learned from them.

In one example of such a “failure,” a partnership between NGOs, military and the private sector formed to implement a high technology solution to combat both illegal fishing and maritime drug trafficking in a remote MPA. It was a pioneer in both its innovative partnership structure and in its technological design.

Initially lauded as a success, the project experienced difficulties likely due to a combination of its remote location, a new partnership with unfamiliar actors, and

the fact that it is truly a prototype technology for what it is being asked to do. Instead of discussing the challenges facing this project openly, however, some in the oceans community speak of its failure as an open secret from which there is nothing to be learned.

The project itself holds interesting information for future technology projects. First of all, the partnership between private and public sector bodies appears to have been a success. The same goes for that between the conservation and military communities. These partnerships are monumental for an issue on which progress, as discussed in the policy recommendations above, is stymied by artificial silos and a “once burned twice shy” attitude about working across sectors.

The desire for immediate success of MPA enforcement technology projects hinders the ability of the oceans community to draw the right conclusions about successes or failures, and slows down the institutional learning process. In the above example, the “failed” project shows a successful understanding of the need for cross sector partnerships and multi-use, customized technology. This story needs to be heard even when the technology fails or is temporarily struggling.



Photo: US Navy/Kwabena Akuamoah-Boateng

An Opportunity for Advancing the Oceans Security Agenda

These recommendations are part of an ongoing body of work at Stimson, focusing on advancing the conversation on the profound linkages between environmental challenges and U.S. and global security — what we call “natural security.” New voices, ideas and partnerships within and between the environmental and security communities are needed to defeat the sophisticated, networked and sometimes militarized groups perpetrating crimes against the environment — on sea and land. In order for that to happen, both the environmental and security communities need to learn to speak each other’s languages, identify common ground in the fight against environmental crimes, and commit to working in concert toward mutually beneficial outcomes.

As world leaders are gearing up for the Our Oceans conference this September, it is our hope that these policy and technology recommendations serves as part of the foundation for fruitful discussions leading to action-oriented outcomes.





About the Authors

Johan Bergenas is a Senior Associate and Director of the Partnerships in Security and Development Program. One of Bergenas' current primary focus is "natural security" — the interlinkages between environmental challenges and U.S. national and global security — as well as on technology and public-private sector partnerships. His background cuts across a wide range of transnational security challenges - from WMD proliferation, terrorism and transnational organized crime. In 2014, Bergenas initiated Project Ngulia, a field initiative to build a new gold standard for natural resource protection. He has brought together a dozen public and private sector partners and technology providers on a pilot project in Kenya. Since 2015, Bergenas has also worked closely with a wide range of environmental and defense organizations to bridge the divide between these institutions on issues ranging from illegal fishing to technology capacity building in developing nations. Bergenas' work has been published in the *New York Times*, the *Washington Post*, *Politico*, *Foreign Affairs*, and *Foreign Policy*. Prior to joining Stimson, Bergenas worked for the Monterey Institute of International Studies and Oxfam America. He has also been a reporter and a freelance journalist for numerous publications, covering a wide range of international and U.S. domestic issues. He holds an honors M.A. degree from the School of Foreign Service at Georgetown University and an honors B.A. degree from the University of Iowa.

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