

WINDWARD^o → eBook

Breaking the Boundaries of Maritime Domain Awareness



Just Putting Dots on the Map is Spotty

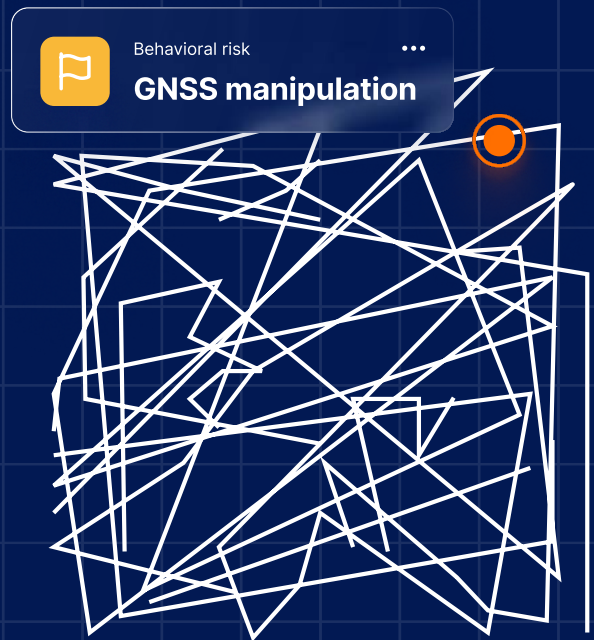
Maritime domain awareness (MDA) is so much more than putting dots on a map to track vessels. MDA and “visibility” – depending on how you define it – are basics available to all players in the maritime ecosystem.

This approach is not sufficient because some of those dots represent ships that are NOT where they purport to be and some vessels are not WHO they purport to be! Not all vessels that transmit are legit – many of today’s more sophisticated bad actors prefer to “hide in plain sight.”

Deceptive shipping practices (DSPs), plus the emergence of the “gray fleet” since the start of Russia’s invasion of Ukraine, have increased and become more sophisticated.

Tracking maps can be inaccurate, or information obtained too late, because some ships that appear to be law-abiding and do not appear on any sanctions lists (yet) are not really as they seem. Some are using techniques, such as location (GNSS) manipulation or multiple ship-to-ship engagements, to obscure their origins (or the origins of their cargo), current location, and destination, which helps them evade detection while engaged in illicit activities.

Understanding what to look for and where to look is a real challenge. It’s tough to find the needle in the haystack – how can you know where and when to look?



Data Dangers

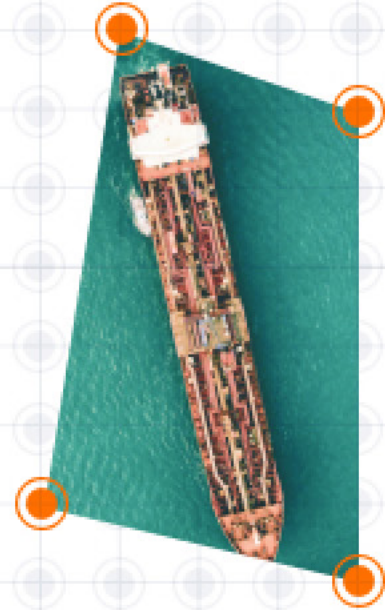
Data is data, right? Can't organizations in the maritime ecosystem just buy automatic identification system (AIS) data? It turns out it's not so easy...

First, we should consider the saying, "Garbage in, garbage out." AIS data comes with a great deal of "noise" and effective AI is not just about data, it involves taking the data and producing actionable insights from it.

Additionally, you would need to spend millions of dollars to obtain ten years of historical AIS data – and working with less than that puts you at risk of not having sufficient data to optimally train and refine AI data models in the complex maritime ecosystem.

If data is not clean, everything built on top of that flawed foundation will be inaccurate. Maritime domain expertise is key for understanding and constantly evaluating data points. It's also critical to be able to take new insights and apply them to historical data. This transforms the existing data into a treasure trove that continues to yield new analytical gems.

Find out more about Windward's [data approach](#).



Why There's a Disconnect...

The rules of the maritime detection game (along with the terminology and technology) have changed. "Going dark" (disabling the AIS system) is still popular, but sophisticated bad actors understand that a vessel worth millions of dollars is too expensive to risk going dark for a single transaction. If identified, the vessel, crew, and owners can not only be exposed to sanctions, but may also suffer from seized cargo and lasting reputational damage. And having a vessel idle for a long period of time could prove costly.

Instead of trying to conceal vessel behavior, many bad actors have changed direction. They now seek to reap the benefit of illegal activities while projecting a veil of "business as usual." In other words, they are hiding in plain sight.

New tactics have emerged, making identity changes look as quaint as a 17th century tactic. An umbrella term called "spoofing" has been driving the maritime industry crazy with multiple interpretations. Within this concept, there are multiple tactics involving the use of various identities, transmitters, and even GNSS manipulation methodologies that are growing at an exponential speed compared to previous deceptive shipping practices.

To learn about the three types of DSPs and much more, check out Windward's [guide to deceptive shipping practices](#).



Revealing the Unknown- Unknowns

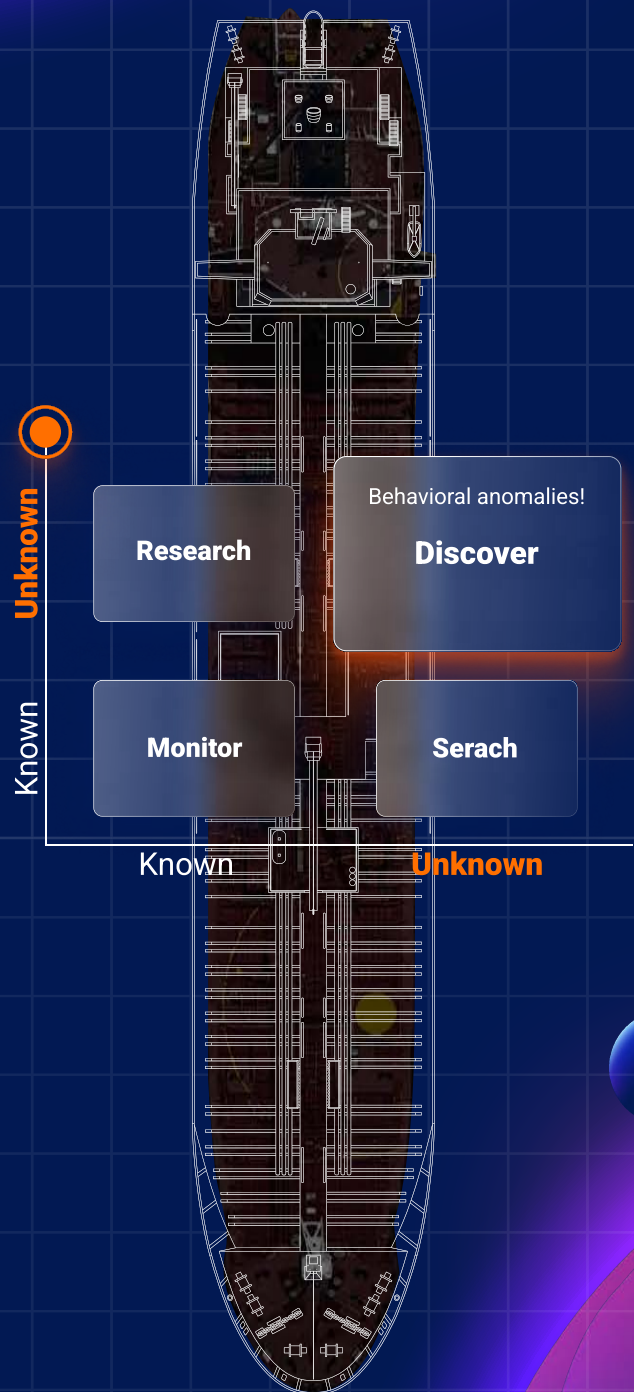
It is easy to obtain visibility and base-level maritime domain awareness, but this baseline does not address unknown factors and it certainly does not address the unknown-unknowns (the factors we do not know that we do not know, to get a little philosophical).

Early detection is critical for achieving maritime domain awareness 2.0. Without sufficient lead time, you may know what is happening, but you are not agile or flexible enough to react in time or strategically.

For obvious reasons, being late to detect a trend, particularly as it pertains to something as important as deceptive shipping practices, could have dire consequences on national and global security.

It's best to be proactive about mitigating emerging threats and focusing on geopolitical expansion attempts.

The right early detection capabilities can flag any behavioral anomaly in areas of interest to you, which could be a game-changer for your organization.



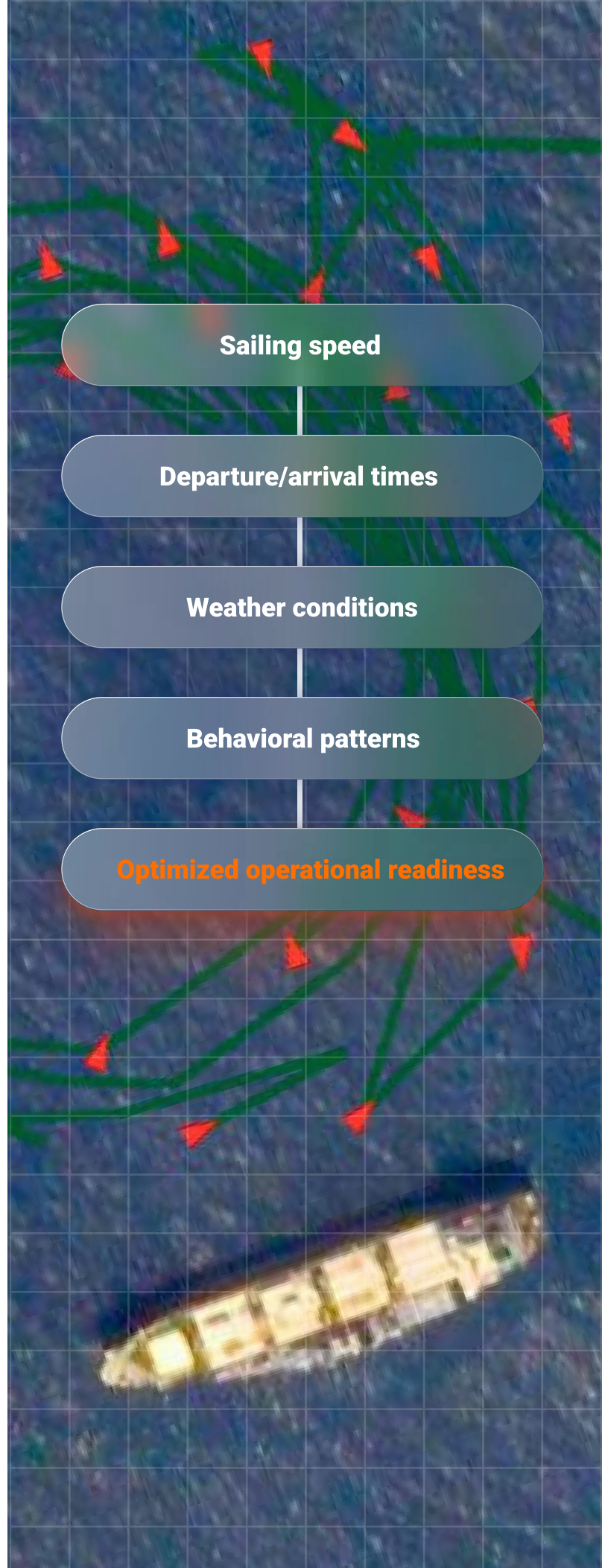
Multi-Source Offers Multiple Benefits

Satellite images are becoming more accessible and are frequently integrated into investigative processes, but no single source captures the full picture. There are a limited number of sensors, certainly not enough to cover all oceans and activities.

Existing sensors have specific revisiting times for each area, meaning even covered areas are not covered 24/7. Since there are never enough sensors, by default you are looking backwards on the area you are investigating, with no real-time tipping and cueing. These limitations mean that optical satellites and SAR technology are great research tools, but not optimal standalone solutions.

Optical images are weather-sensitive and offer a snapshot in time, as opposed to continuous monitoring. SAR is much less cost-effective than optical satellite images and requires knowing exactly when and where they should be tasked in advance. Radio frequency detection only offers restricted coverage with an uncertain radius resolution, and is weather-sensitive. In addition, all three solutions lack coverage and especially context when not used as an extra layer.

The ideal solution takes an innovative AI base and fortifies it with daily satellite and on-demand SAR images, supporting imagery analytics to help detect suspicious objects, and imagery integration. With AI-based MDA platforms and solutions, you can predict where to focus the sensors, bringing efficiency and value.



Fighting False Positives... Without Forgetting False Negatives

False positives, when a vessel is wrongly suspected of engaging in DSPs when it isn't, are a heavy burden on business. Unfortunately, they are often simply accepted as part of conducting due diligence. But there is a lot that can be done to fight false positives and boost business.

When screening vessels, one of the best ways to do this is by applying domain expertise and context to vessel screening according to the type of commodity and the regime in question. By doing so, a Maritime AI™ system can help reduce the number of false positives and prioritize the ones that point to the higher risks.

False positives are known to be harmful to business productivity, strategic planning, and sensitive operations. False negatives, thinking a vessel engaged in illegal activity is clean, meanwhile, are often missed, even though they can result in crippling fines and the overlooking of potential national threats and global risk developments.

0.4%

out of 600,000 signal losses were related to sanctions evasions

+1,900

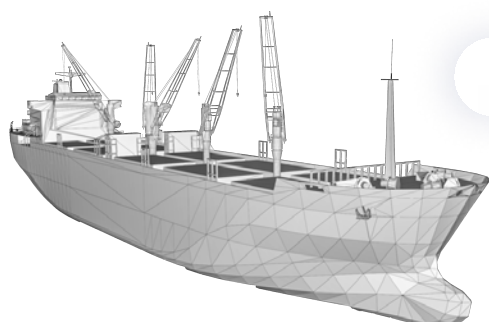
identified cases of location (GNSS) manipulations

Relying solely on the dots without AI-driven models may lead to business-harming false positives and negatives

Don't Forget the Shadows

After the West's economic vice tightened on Russia for its Ukraine war, there was an increase in DSPs – a combination of dark activities, location (GNSS) manipulation, and ship-to-ship meetings. New hubs have continued to pop-up for concealing illicit activities as old ones draw increased scrutiny, and Iran and Russia strengthened their trade routes.

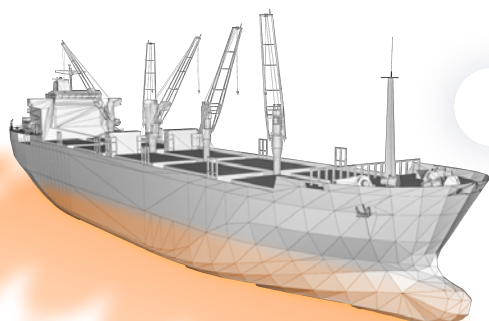
Windward's Maritime AI™ platform identified a three-tiered system of vessels to paint an accurate picture of Russian oil smuggling:



Cleared fleet

01

Tankers not exhibiting any suspicious conduct. It is important to be able to quickly identify these vessels, so that maritime organizations are not paralyzed by false positives and indecision that will further hamper global trade.



Gray fleet

02

A completely new phenomenon evolving from the Russia war. Overseas companies have been quickly established following the outbreak of the war, to obscure vessel origins and ownership, and to appear law-abiding/non-sanctioned. This fleet is described as "gray" because it is difficult to determine legality and sanctions compliance in many cases.



Dark fleet

03

This fleet often utilizes dark activities to move wet cargo, along with other DSPs, such as ID and location manipulation.

Don't Depend on the Dots!

The maritime ecosystem changes quickly and maintaining MDA operational readiness and strategic decision-making capabilities requires the right technology platform.

Windward, the leading Maritime AI™ company, can help you find the needle in the haystack – not only do we connect the maritime dots for you, we tell you why to look, when to look and where to look.

Without clean and fused data and an AI-powered solution, it is impossible to analyze hundreds of millions of data points to quickly arrive at an accurate risk prediction, and act upon it to mitigate risk exposure. Maritime AI™ protects businesses from false negatives, which can result in jeopardizing national security, by effectively analyzing the data and understanding patterns.

And our early detection capabilities are designed to automatically identify behavioral outliers of maritime entities, by continuously analyzing data sets and profiling.

Windward understands today's obstacles and the solutions to overcoming them. Without AI-based predictions based on models that are constantly refined by maritime experts, standard MDA solutions cannot deliver actionable insights that will make your organization far more capable of complying with regulations, while staying profitable. We'll empower you to avoid false positives...and false negatives, while mitigating risk effectively and improving your strategic decision-making abilities.



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The Power of Maritime AI™

Want to move past the basics and achieve maritime domain awareness 2.0? Windward's Maritime AI™ platform can connect the dots for you!