



TURNING THE TIDE ON IUU FISHING

How Pole Star Defense Supports Global Maritime Security

I. Executive Summary

Illegal, Unreported, and Unregulated (IUU) fishing is no longer just an environmental or regulatory concern—it is a strategic threat to national sovereignty, economic resilience, and global maritime stability. It exploits jurisdictional blind spots, cloaks itself behind spoofed identities and “dark” operations, and is increasingly linked to transnational crime, sanctions evasion, and forced labor.

Confronting this threat requires more than broad awareness—it calls for deep, operational visibility into the maritime domain: the vessels involved, their supporting logistics, ownership structures, and the recurring patterns that enable IUU activity to persist across global waters.

Pole Star Defense is uniquely positioned to meet this challenge. Our platform goes beyond tracking vessels—we expose the patterns, actors, and risks behind IUU operations through real-time monitoring, dark vessel detection, sanctions screening, and integrated mission-ready intelligence. From sovereign data centers to secure API integrations for defense users, we provide the tools governments need to act—faster, smarter, and with greater confidence.

This white paper presents a deep dive into IUU activity in the South Pacific and South Atlantic, highlighting how Pole Star’s intelligence platform uncovered spoofing, dark operations, and reefer-based transshipment networks tied to high-risk fleets. But more than a case, it’s a blueprint: a demonstration of how visibility at scale can shift the balance—from reacting to deterring.

Pole Star Defense helps you see what others miss—so you can enforce what others can’t.

II. IUU Fishing: A Global Threat

IUU fishing now accounts for up to one in every five fish caught globally, costing the world economy an estimated \$23 billion annually (FAO). It disproportionately harms developing coastal nations while also undermining the sustainability of legitimate fisheries.

Sophisticated actors—including transnational criminal organizations—use tactics such as AIS spoofing, flag hopping, and “dark” operations (vessels disabling location reporting systems) to avoid detection. The scale and complexity of the problem require coordinated international response, enhanced data-sharing, and real-time visibility across global waters.

III. Impact on U.S. Interests

For the United States, IUU fishing is more than an ecological concern—it is a strategic challenge that affects:

Impact on U.S. Interests

Homeland Security

IUU fishing networks are often linked to smuggling, forced labor, and sanctions evasion.

Economic Resilience

It undercuts the livelihoods of American fishermen and seafood industries.

Maritime Sovereignty

IUU activity frequently occurs in or near Exclusive Economic Zones (EEZs), threatening U.S. jurisdiction and operational readiness.

Environmental Goals

It jeopardizes global sustainability and undermines climate resilience objectives.

The U.S. has prioritized the fight against IUU fishing in its National Security Strategy and Maritime SAFE Act, recognizing it as a multi-domain threat requiring ISR (Intelligence, Surveillance & Reconnaissance) and public-private cooperation.

IV. Case Insight: Southwest Pacific & South Atlantic IUU Network

Pole Star Defense has tracked a persistent pattern of IUU fishing across the high seas borders of three highly targeted EEZs: the Galápagos Islands, Peru, and Argentina. In both regions,

long-range industrial fishing fleets—primarily flagged to China—operate in international waters for months at a time, targeting migratory squid and small pelagic fish.

Key findings include:

- **Extended periods of non-transparent behavior**, including AIS signal suppression and positional anomalies near EEZ boundaries
- **Spoofing Events:** Several vessels were detected broadcasting false positions, including overlapping AIS signals or "ghost" locations hundreds of miles away.

Concurrent Vessel Activity - Operational Pattern Analysis

AIS Reporting Window: 04 - 25 JAN 2024

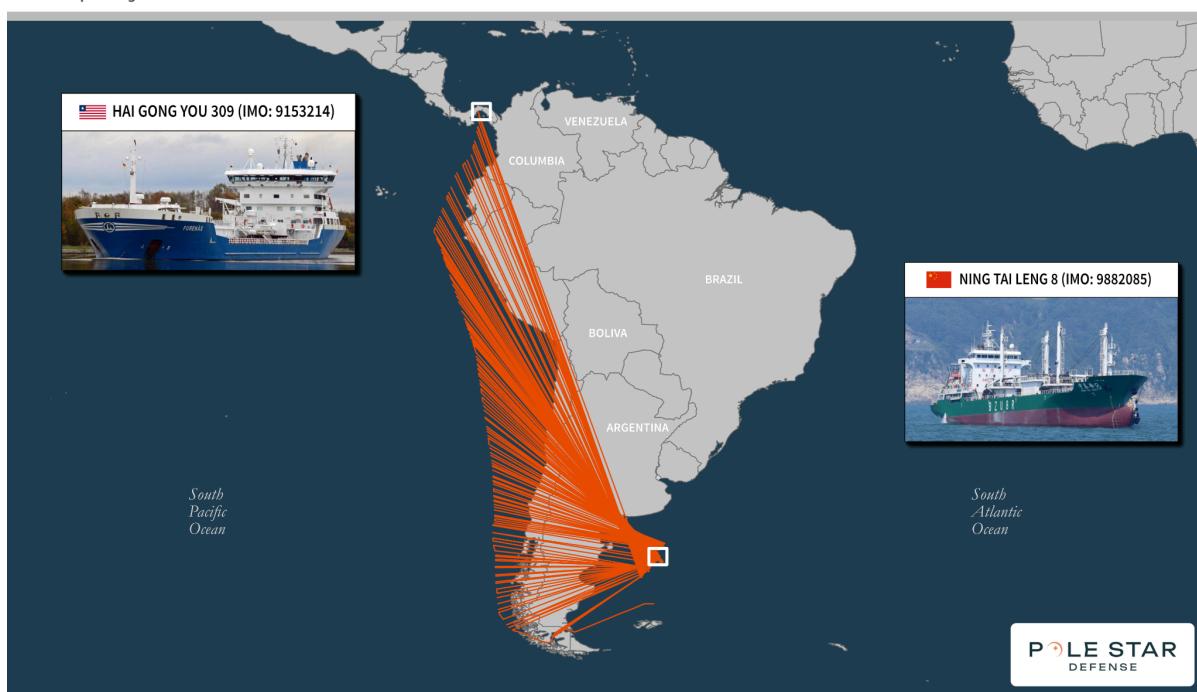


Figure 1. Concurrent Vessel Activity – Operational Pattern Analysis (04–25 Jan 2024). This map highlights overlapping AIS-reported movements of the HAI GONG YOU 309 (IMO: 9153214) and NING TAI LENG 8 (IMO: 9882085), both operating within the same South Pacific corridor over a 21-day window. The mirrored southbound trajectories and timing of operations may suggest coordinated behavior or shared logistical intent. While no direct encounter is confirmed, the temporal and spatial convergence of these two vessels may warrant closer scrutiny in the context of transshipment or support activity linked to distant-water fishing operations.

- **Reefer Vessel Support:** Pole Star identified a fleet of reefer vessels—refrigerated cargo ships that collect and transport catch from multiple fishing vessels at sea.
 - **Definition:** A reefer vessel is a specialized ship equipped with temperature-controlled holds, used to transfer and preserve seafood during long-distance transport.

Global Patterns of Refrigerated Cargo Activity in High-Risk Maritime Zones

Dwell Hotspots and Port Call Locations | Jan 2024 - Mar 2025

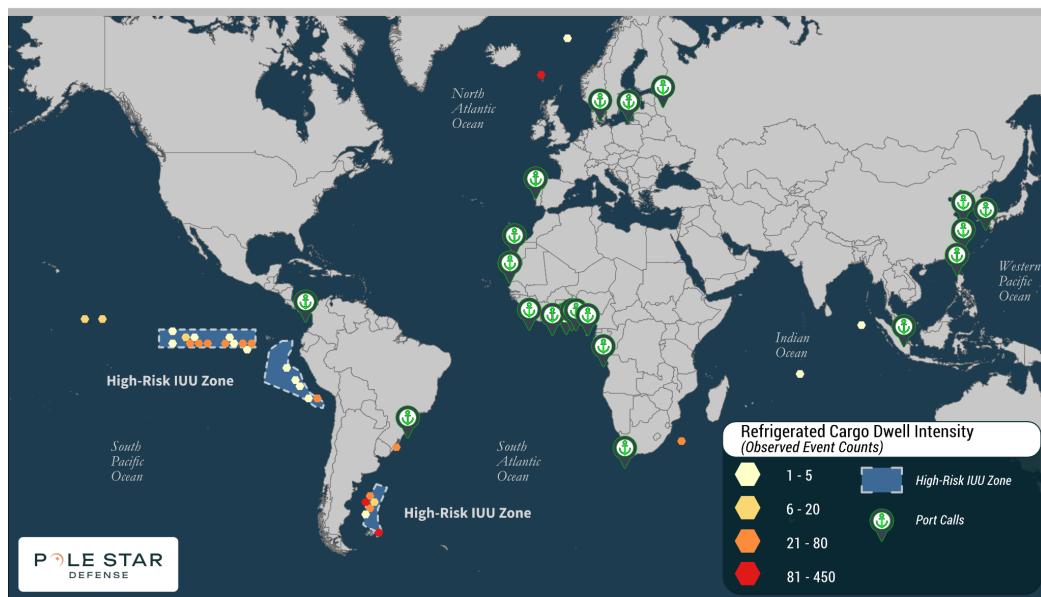


Figure 2. Global Patterns of Refrigerated Cargo Activity in High-Risk Maritime Zones (Jan 2024 – Mar 2025). This map illustrates areas where refrigerated cargo vessels (reefers) exhibited elevated dwell behavior, aggregated using a global hex bin grid. Event frequency is color-coded to reflect dwell intensity, while known port call locations are marked to support interpretation of vessel logistics and potential transshipment behavior. High-Risk IUU Zones are overlaid to highlight proximity between suspected reefer dwell clusters and regions of concern for illegal, unreported, or unregulated (IUU) fishing. Dwell locations reflect AIS positions with speeds < 0.5 knots.

Ship-to-Ship Transfers Linked to High-Risk Maritime Zones

Observed Events | Jan 2024 - Mar 2025

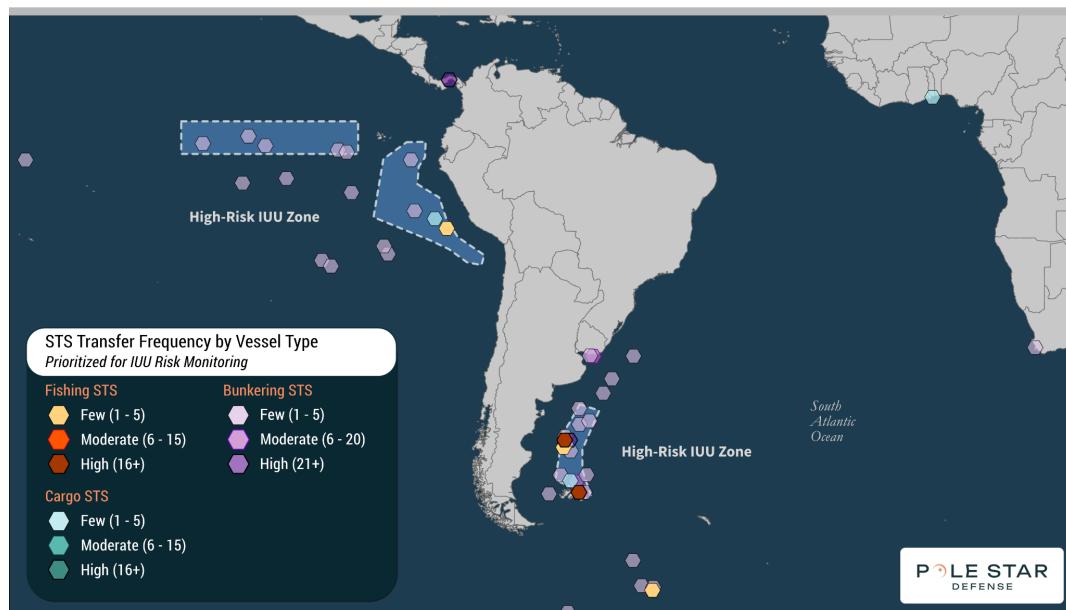


Figure 3. Ship-to-Ship (STS) Transfers Linked to High-Risk Maritime Zones (Jan 2024 – Mar 2025). This map visualizes observed STS transfer activity across three vessel categories—Fishing, Cargo (Refrigerated), and Bunkering—using hexagonal spatial aggregation. STS event counts are grouped into three classes (Few, Moderate, High) based on frequency per 300 km-diameter hexagon. High-Risk IUU Zones are highlighted to emphasize spatial correlation between STS hotspots and known areas of illegal, unreported, or unregulated (IUU) fishing concern.

These vessels allow IUU fishing fleets to avoid regulated port landings, conceal catch volumes, and maintain operations at sea for extended periods.

Refrigerated Cargo - AIS Signal Gap Assessment

19 OCT - 12 NOV 2024 | North Atlantic Transit | 2,650 NM Coverage Gap

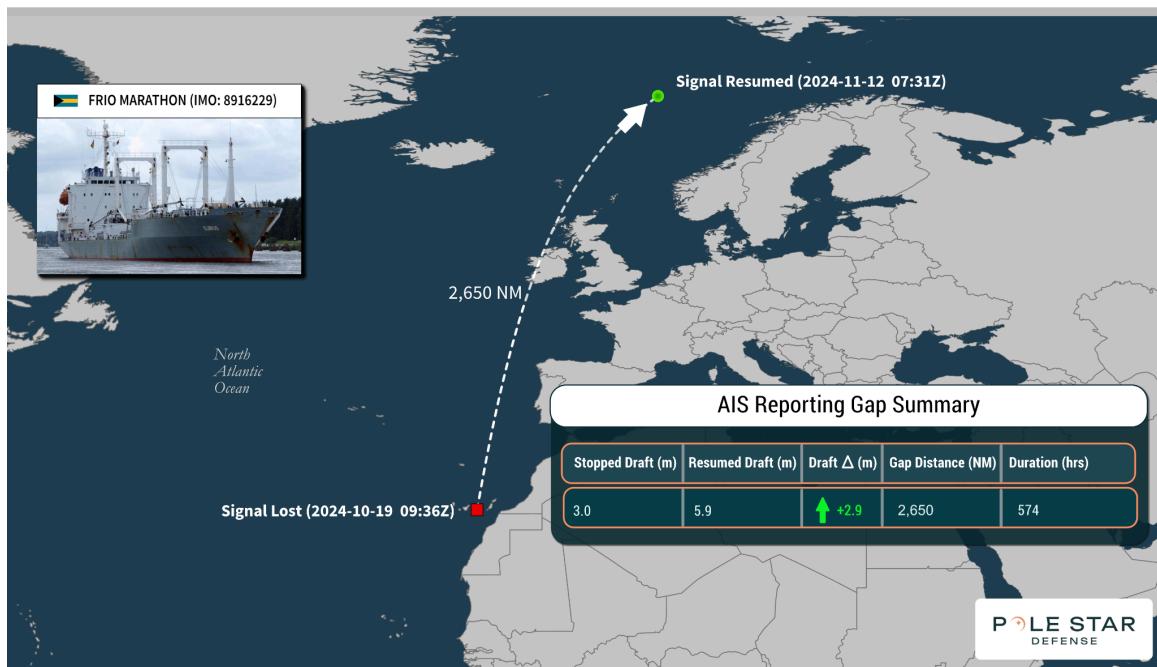


Figure 4. Refrigerated Cargo – AIS Signal Gap Assessment (Oct–Nov 2024). This map depicts a 2,650 NM AIS reporting gap during the FRIO MARATHON's North Atlantic transit, lasting approximately 574 hours. During this period, the vessel's reported draft increased from 3.0 to 5.9 meters. This change may suggest cargo loading, ballast water intake, or a combination of both. The absence of AIS transmissions throughout this draft change highlights a potential transparency risk and warrants further scrutiny under IUU risk monitoring frameworks.

Beyond the fishing vessels themselves, Pole Star used its data platform to uncover the support ecosystem:

- **Bunkering Tankers:** Refuelers traveling from West Africa and East Asia to sustain long-term offshore operations.
- **Logistics Vessels & Registries:** Flag-hopping and beneficial ownership data revealed the companies that owned the vessels and the countries they were registered in—often masking real operators behind complex corporate structures.
- **Port Visit Patterns:** Vessels offloading catch or refueling in Montevideo, Las Palmas, Qingdao, and Cape Town—ports with known IUU transshipment histories.

Through this analysis, Pole Star delivered a full intelligence package including:

- **Vessel histories** (AIS tracks, time at sea, port calls)
- **Ownership data** including beneficial owners
- **Sanctions exposure** (links to entities previously flagged for human rights violations and smuggling)
- **Pattern-of-life analytics** highlighting repeat behavior across seasons and years

This level of intelligence equips governments with clear insights into who they are dealing with—and the potential risks of engaging with actors tied to IUU operations, either directly or through supply chain exposure.

Registration & Flag Details

Flag:	Bulgaria
Flag Effective Date:	9/1/2016
Port of Registry:	Shidao, Shandong
Classification Society:	Union of Independent Ship Classifiers

Ownership & Management

Registered owner:	Shenzhen BlueOcean Reefer Transport Ltd.
Group beneficial owner:	Pacific Meridian Holdings Group
Operator:	Shenzhen BlueOcean Reefer Transport Ltd.
Ship manager:	Shenzhen BlueOcean Reefer Transport Ltd.
Technical manager:	Unknown

***Illustrative image only; not indicative of any specific vessel referenced in this white paper or associated operations.*

V. How Pole Star Defense Supports IUU Enforcement

1. Persistent Maritime Domain Awareness

Pole Star's MDA platform delivers persistent, high-fidelity vessel monitoring—fusing AIS with other relevant maritime data sources. It detects anomalies in vessel behavior, alerts authorities to dark activity, and helps prioritize inspection and enforcement resources.

2. Dark Vessel Detection & Spoofing Alerts

Through spoofing and AIS gap detection, Pole Star identifies when vessels obscure their identities or locations—common tactics of IUU actors. Combined with predictive behavior modeling, these insights help stop illicit operations before they cross into U.S. EEZs or protected waters.

3. Customizable Monitoring Zones

Agencies can set up real-time alerts for incursions in high-risk regions such as Pacific tuna corridors, Arctic fisheries, or Caribbean EEZs. This enables dynamic response to suspected illegal trawling, transshipment, or unauthorized anchoring.

4. Sanctions & Compliance Screening

PurpleTRAC, Pole Star's compliance module, screens vessels and cargo against U.S., EU, OFAC, and UN lists—vital for uncovering flag-hopping schemes and ownership networks that shield IUU operations.

5. National Data Center Capabilities

Pole Star builds and operates National Data Centers used by over 60 governments. These platforms help authorities consolidate enforcement data, streamline international coordination, and standardize IUU detection across jurisdictions.

6. Secure API Integration & Mission-Ready Intelligence

Defense users can integrate Pole Star's APIs directly into on-prem environments, ensuring rapid intelligence access for Coast Guard, NOAA, and DoD missions. In addition, we work closely with our public sector mission partners to support operations in their environments whether deploying existing solutions or building new capabilities to meet FedRAMP, NIST, ITAR, or other standards.

VI. Strategic Impact

Our reach goes well beyond the IUU fishing networks outlined in this white paper. While this use case illustrates the urgency and complexity of one of today's most pressing maritime challenges, the principles demonstrated—persistent monitoring, behavioral intelligence, dark activity detection, and cross-source data fusion—apply across the full spectrum of maritime security, sovereignty, and compliance needs.

From defense and homeland security to environmental enforcement and port-state control, Pole Star Defense equips governments and allied partners with:

- **Decision Superiority with real-time, cross-source intelligence**
- **Mission-Aligned Tools for coastal patrols, port inspections, and EEZ enforcement**
- **Operational Efficiency through automation and data fusion**
- **Global Interoperability with allies and multilateral frameworks**
- **Risk Exposure Insights to ensure governments and regulated industries know who they're doing business with**

VII. Conclusion

You can't defend against what you can't see.

And you can't intercept what you can't track or trust.

Whether your mission is to protect sovereign waters, enforce sanctions, disrupt illicit supply chains, or ensure sustainable fishing practices—Pole Star Defense gives you the intelligence advantage. We connect the dots across vessels, owners, flags, and behaviors—exposing what others miss and delivering real-time, mission-ready intelligence you can trust.

So ask yourself:

- Can your agency detect spoofing across fleet movements today?
- Can you confidently identify dark activity before it crosses your EEZ boundary?
- Are you certain you're not unknowingly engaging with vessels linked to IUU or sanctions exposure?

If the answer to any of these is no—we're ready to help you change that.

See what full maritime domain awareness looks like.

Visit polestarglobal.com/defense to [book a demo](#) and discover how Pole Star Defense can transform your mission outcomes.

****Technical Notes and Map Details**

All maps presented in this white paper were developed using AIS-derived vessel tracking data and geospatial analysis conducted with ESRI ArcGIS Pro and affiliated spatial analytics tools. Map symbology reflects distinct operational behaviors, including vessel dwell intensity, AIS signal gaps, port calls, and ship-to-ship (STS) transfer activity.

Ship-to-Ship (STS) events were identified through a custom proximity-based detection algorithm that analyzes spatiotemporal vessel interaction patterns. The algorithm isolates sustained co-location behaviors between two underway vessels, indicative of potential at-sea transfer operations. This approach is particularly suited for identifying interactions involving fishing vessels, bunkering tankers, and refrigerated cargo carriers.

Dwell events were identified from AIS position reports indicating a vessel speed of less than 0.5 knots for extended periods. This threshold was selected to distinguish true stoppage from slow transit or loitering behavior. Observed dwell events were then aggregated using 300 km diameter hexagonal bins to highlight concentration zones.

AIS signal gaps are represented as geodesic lines between the last reported and next received positions, with annotated durations, distances, and draft changes where available. Draft deltas may suggest operational activity during the blackout period, such as cargo transfer or ballast adjustment.

High-Risk IUU Zones, delineated with dashed blue outlines, reflect areas identified as having elevated risk for illegal, unreported, or unregulated (IUU) fishing. These zones were defined using historical AIS patterns, enforcement gaps, and known hotspots of suspicious maritime activity. Port call icons denote vessel arrivals at recognized ports, derived from AIS data indicating anchorage or berth proximity.

All timestamps are expressed in Coordinated Universal Time (UTC). Vessel photography is included where available to support identification and context.

Basemap Attribution: Basemap layers used for data visualization in this report are © Esri.

Citations

- i. Food and Agriculture Organization of the United Nations (FAO). 2022. The State of World Fisheries and Aquaculture 2022. Rome: FAO. <https://www.fao.org/3/cc0461en/cc0461en.pdf>.
- ii. United States Congress. 2019. Maritime Security and Fisheries Enforcement (SAFE) Act. Public Law No. 116-92, sec. 3551-3562. <https://www.congress.gov/116/plaws/publ92/PLAW-116publ92.pdf>.
- iii. Keating-Bitonti, Caitlin, and Anthony R. Marshak. 2024. Illegal, Unreported, and Unregulated (IUU) Fishing: Frequently Asked Questions. CRS Report R48215. Washington, DC: Congressional Research Service. https://www.everycrsreport.com/files/2024-10-08_R48215_0574f7624785be5ce771ead98c98d8560132b0bc.pdf.
- iv. European Commission. 2024. "Fighting Illegal, Unreported and Unregulated Fishing: New Report on 2020–2023 Achievements." Directorate-General for Maritime Affairs and Fisheries, April 18. https://oceans-and-fisheries.ec.europa.eu/news/fighting-illegal-unreported-and-unregulated-fishing-new-report-2020-2023-achievements-2024-04-18_en.
- v. FAO. 2024. Implementation of the International Plan of Action to Prevent, Deter and Eliminate IUU Fishing. Rome: FAO.
- vi. Marshak, Anthony R. 2025. "President Trump's April 2025 Executive Order on American Seafood Competitiveness: Considerations for U.S. Fisheries." Congressional Research Service In Focus, IF13017, June 3. <https://www.congress.gov/crs-product/IF13017>.
- vii. United Nations Office on Drugs and Crime (UNODC). 2022. Transnational Organized Crime in the Fishing Industry: Focus on Trafficking in Persons, Smuggling of Migrants, Illicit Drugs and Arms Trafficking. Vienna: UNODC.
- viii. United States Coast Guard (USCG). 2020. Illegal, Unreported, and Unregulated Fishing Strategic Outlook. Washington, DC: USCG. <https://www.uscg.mil/iuu>.
- ix. National Oceanic and Atmospheric Administration (NOAA). 2023. IUU Fishing Task Force Progress Report. Washington, DC: NOAA.
- x. Pole Star Defense. 2025. Dark Fleet and AIS Spoofing Trends. Internal findings. London: Pole Star Defense.