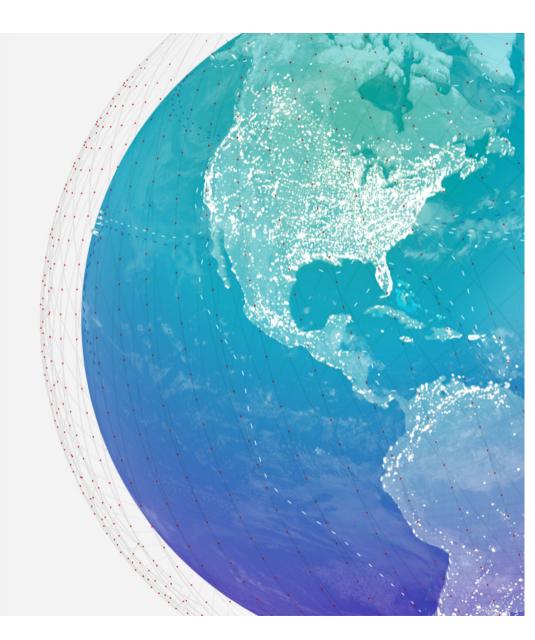# APPLYING AIS DATA TO MARINE SHIPPING RISK

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Agenda
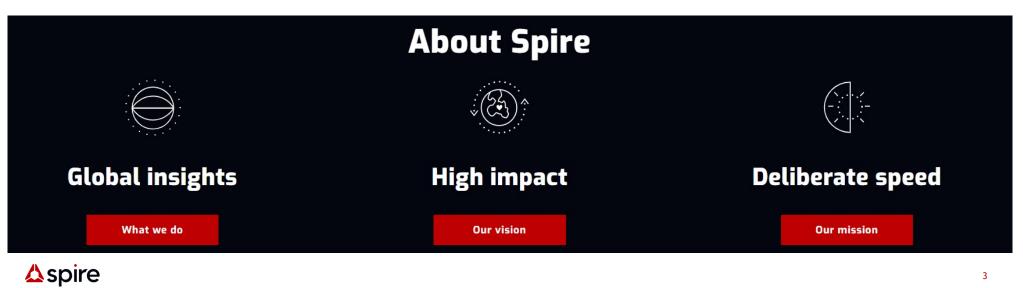
1. Introductions: Spire and AIS
2. Enhancing Situational Awareness with AIS
   1. Tackling Illegal Fishing
   2. Mitigating Risks of Oil and Gas/Offshore
   3. Environmental preservation
   4. Reducing Emissions and Protecting Resources
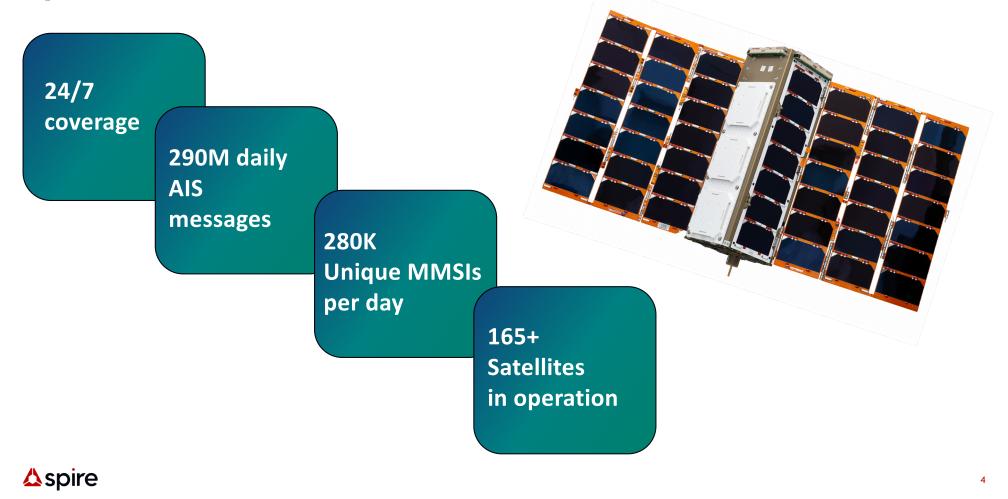3. Looking Ahead: Navigating Arctic Shipping

Spire

Covering the earth 24/7

We are a data and analytics provider that collects data from space to solve problems on earth!

Our Mission is to use the information we collect and analyze to help make our world a safer, cleaner, more prosperous and more equitable place.

About Spire

Global insights — What we do

High impact — Our vision

Deliberate speed — Our mission

Spire + exactEarth = Better AIS data

24/7 coverage

290M daily AIS messages

280K Unique MMSIs per day

165+ Satellites in operation

![spire logo]

Global Data and Analytics

Spire collects rich and unique datasets, tracking the oceans, skies, and weather 24/7

Weather
We're setting a new benchmark in the weather industry. The radio occultation profiles collected by our satellites bring a unique understanding of global weather conditions.

Maritime
We're revolutionizing how maritime data is collected, analyzed, and delivered. Our innovations, like Dynamic AIS™, solve industry challenges and give our customers a competitive advantage.

Aviation
Spire Aviation is solving needs in the aviation and logistics industries. Our enhanced position data fills gaps in areas out of reach of existing ADS-B data collection.

Earth Information
Spire uses its satellites to collect data from beneath the earth's surface to the edge of the atmosphere. This rich data set is available to support research and development projects.

Spire Space Services
Designed to accommodate new customer payloads quickly and efficiently allowing for an incredibly fast rollout of new capabilities with a flexible and consistent launch schedule.
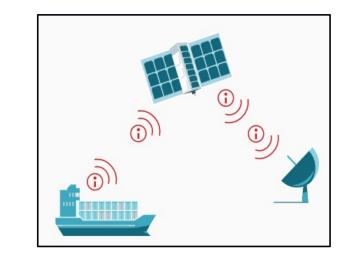
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5

What is AIS?

- **Automatic Identification System (AIS)** is a vessel tracking system used for ship-to-ship, ship-to-shore, and shore-to-ship communication.
- Developed as a collision avoidance system
- Mandated by the IMO
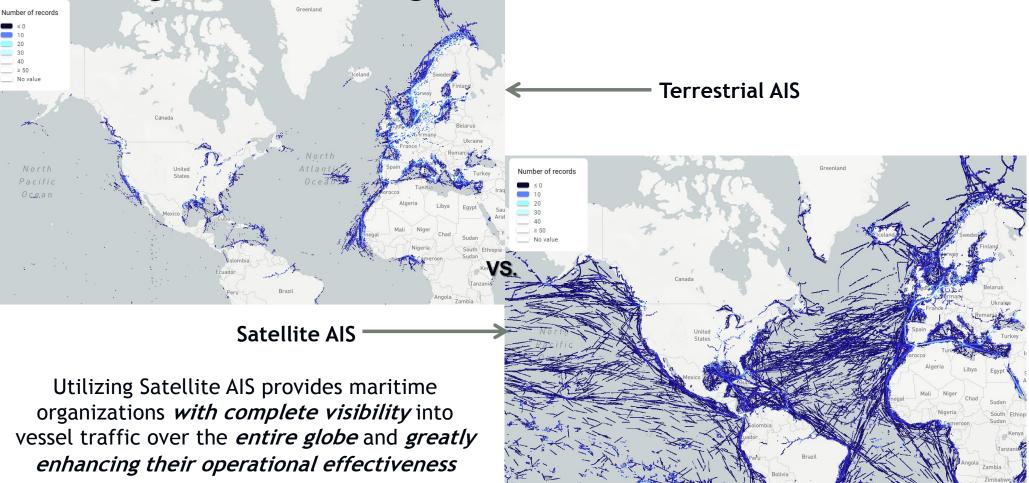- Sent via RF from on-board equipment

Types of AIS

	Broadcast	Frequency
Class A	• MMSI • position, speed, course, heading, maneuver • IMO, Call Sign, Name, Vessel Type, Destination, Draught, Dimensions	• 2 to 10 seconds or 3 mins for position messages (1,2,3) • 6 minutes for static and voyage related messages (5)
Class B	• MMSI • position, speed, course, heading, maneuver • Call Sign, Name, Vessel Type, Dimensions	• 3 mins or less for position messages (18, 19) • 6 minutes for static and voyage related messages (24)

• Other message types: Base Station, AtoNs, SAR, Binary messages (ASM),…

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Tracking Vessels Using S-AIS

Terrestrial AIS

VS.

Satellite AIS

Utilizing Satellite AIS provides maritime organizations *with complete visibility* into vessel traffic over the *entire globe* and *greatly enhancing their operational effectiveness*

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Enhancing Situational Awareness with AIS

What risks is AIS most useful for?

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Tackling Illegal Fishing

- **The Problem:** IUU fishing is a major threat to achieving sustainable fisheries.
  - According to the United Nations Food and Agriculture Organization (FAO), the world's authority on fisheries 34.2% of fisheries are overfished.

- A need for better surveillance, reporting and enforcement of regulations for commercial fishing.

- Global Fishing Watch: Applying Spire's AIS to help collect AIS data to identify fishing activity and promote transparency

In efforts to combat illegal fishing around the world, Spire AIS data provides:

Immediate identification of non-cooperative IUU vessels in the vicinity of legitimate fishing vessels, allowing for a more targeted response

Dynamic data that allows authorities to identify spoofed position reports when comparing a vessel's reported latitude and longitude

Extended surveillance range beyond traditional methods to include areas where vessels are not intended to be fishing

Mitigating Risks of Oil and Gas/Offshore

- The oil and gas industry will continue to push the limits in terms of geography in order to sustain global demand for energy

- **Problem**: A vessel striking assets out in open water can cause structural and environmental damage that is often irreversible.

- It is imperative to have monitoring tools in place to mitigate risk

- **AIS Ultimately improves asset protection and reduces the cost of remote asset monitoring with a comprehensive risk picture**

With Spire AIS data, oil and gas industry companies can:

Continuously track vessel movements in and around assets that are farther offshore

Mitigate risks with a comprehensive and accurate maritime picture

Monitor all vessel activity being conducted across upstream, midstream, and downstream operations

Environmental Preservation

- The need to preserve PSSA's and MPA's and Identify areas of be avoided

- **Problem**: Although shipping is the anchor of the global economy, this intense level of vessel traffic can be a detriment to the marine environment

- S-AIS as surveillance

Through the use of Spire AIS data, organizations can:

Establish automated alerting of vessels entering a Marine Protected Area (MPA) or approaching navigation hazards, preventing environmental incidents

Maintain vessel historical tracks for investigative reporting purposes, helping to curb illegal fishing and detect and identify oil spills and marine pollution violations

Geo-fence environmentally sensitive areas and MPAs to analyze historical ship traffic patterns within these areas to increase violator prosecutions

Reducing Emissions and Protecting Resources

Port Operations and Fleet Management

- As maritime traffic increases and the pressure on vessels to provide a "just in time" delivery grows, it's vital that effective and safe ship routing is in place

- **Problem:** Not having real-time access to an accurate picture of global shipping can put the crew, cargo, vessels and the ocean environment at risk!

- Effective allocation of resources to reduce emissions using S-AIS
  - Optimize routes for fuel consumption around currents and wave swells
  - Historical shipping patterns and trends for accurate risk modeling

For port and ship operators, owners and brokers, AIS translates into very real benefits such as:

Complete visibility into all ship position reports for more efficient route scheduling and better use of resources at port calls

Monitor and respond to crisis events

Real-time fleet tracking and monitoring of the complete voyage to track all route deviations and stoppages, as well as to monitor ship ETAs to accommodate schedule changes

Looking Ahead: Navigating Arctic Shipping

- The expectation is that arctic sea-lanes might be regularly free of summer ice by 2035.

- The complex impact of climate change: New route opportunities vs. new challenges

- Problem: The impact arctic shipping can have on wildlife habitats throughout the region and the Native Communities that live there.

- Another concern is that, although the potential savings of sailing the Arctic Ocean are significant, the routes will also likely be highly unpredictable

- These remote areas have previously proved difficult to monitor but S-AIS can provide real benefits to deliver vessel monitoring capabilities across the Arctic and Antarctic waters

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Thank you!

From our team, to yours.