



Distributed Fiber Sensing – Security of Critical Infrastructure at scale

September 2025

Why is it Critical to Protect Subsea Cables?

- Submarine cables carry 95% of internet traffic.
- A single outage can disrupt financial markets, e-commerce, cloud services and government communications.
- Repairs can take weeks, leading to GDP loss, reputational damage, and civil unrest.
- In conflict zones, cables are a soft target for cyber-physical warfare.
- Building resilience into cable systems is essential to national security and economic stability. Protection of subsea assets is not a nice to have - it's a must have.

The Priorities for Protection

- **Accidental Damage:** Fishing vessels, anchors, and natural disasters like earthquakes and landslides can damage cables.
 - According to International Cable Protection Committee statistics, fishing and anchoring accounts for approximately 70 percent of global damage to submarine cables.¹
 - Exposure and suspension leading to cable strumming is another important cause of failure.
- **Deliberate Interference:** In some cases, cables have been targeted for sabotage or disruption.
- **Geopolitical Tensions:** Subsea cables can become targets during times of geopolitical conflict or instability.

1. Government Best Practices for Protecting and Promoting Resilience of Submarine Telecommunications Cables'
United Kingdom: International Cable Protection Committee, updated 18 November 2022,
<https://www.iscpc.org/publications/icpc-best-practices/>
Ref - <https://www.submarinenetworks.com/en/nv/insights/statistics-on-subsea-cable-fault-and-repair>

Security of Subsea Cables

Australian Context

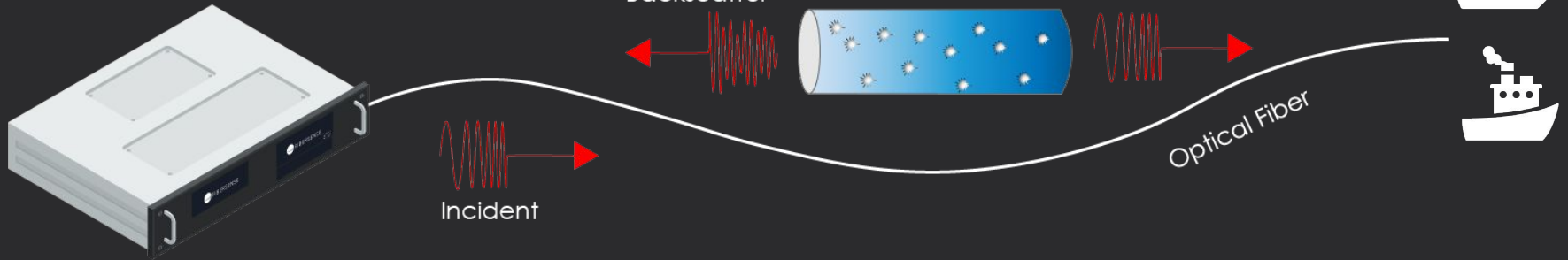
- **Submarine Cables and Pipelines Protection Act 1963 (SCAPPA)** is Australia's original domestic legislation for the protection of submarine cables and pipelines. This Act reflects Australia's commitment to international obligations, particularly those derived from the 1958 Convention on the High Seas.
- **Telecommunications Act 1997** supplements the old act and provides for a more robust approach to protecting subsea cables. It allows the Australian Communications Media Authority (ACMA) to declare a "protection zone" (CPZ's) around submarine cables of national significance within Australian territory. A key purpose of a protection zone is to provide enhanced security and protection for submarine cable(s) that lie within the limits of the zone by restricting or prohibiting activities that have the potential to damage cables.
- **Security of Critical Infrastructure Act 2018 (SOCI Act)** supports the protection of subsea cables by including them as a form of critical infrastructure. Subsea cables fall under the "communications" sector and are specifically categorized as a critical telecommunications asset. This imposes specific obligations on the owners and operators of these assets. These measures are designed to enhance security, resilience, and government oversight. The Act mandates that responsible entities for critical infrastructure assets, including subsea cables, must have and maintain a **Critical Infrastructure Risk Management Program (CIRMP)**.

Meet FiberSense

- FiberSense is an Australian company that is focused on civilian applications of distributed fiber sensing technology.
 - Providing near real-time, software-defined sensing for subsea cables.
- FiberSense is able to deploy large continuous SONAR like sensing apertures up to 150km per span on the ocean floor through new or existing fiber optic cables.
- This capability is referred to as DigitalMarine™.
- DigitalMarine is near real time detection and classification capability of objects and events in the vicinity of subsea cables, detecting threats like anchor drag, fishing and seismic events.
- DigitalMarine advantages include rapid wide scale deployment over existing subsea fiber cables with a low cost to capability ratio. Is a very cost-effective monitoring method when compared with techniques such as patrolling via guard vessels.

How does Distributed Fiber Sensing Work?

Laser Equipment and Computer



Optical pulses are sent down the fiber and the small reflections from the fiber are detected with a highly tuned receiver to pick up events and objects around the cable with classification algorithms that really work in oceans.

FiberSense - Global footprint – 70 paths



12

Countries
20 cities, 4 Oceans



17+

Contracted
customers



1,970

Active fiber
kilometres monitored



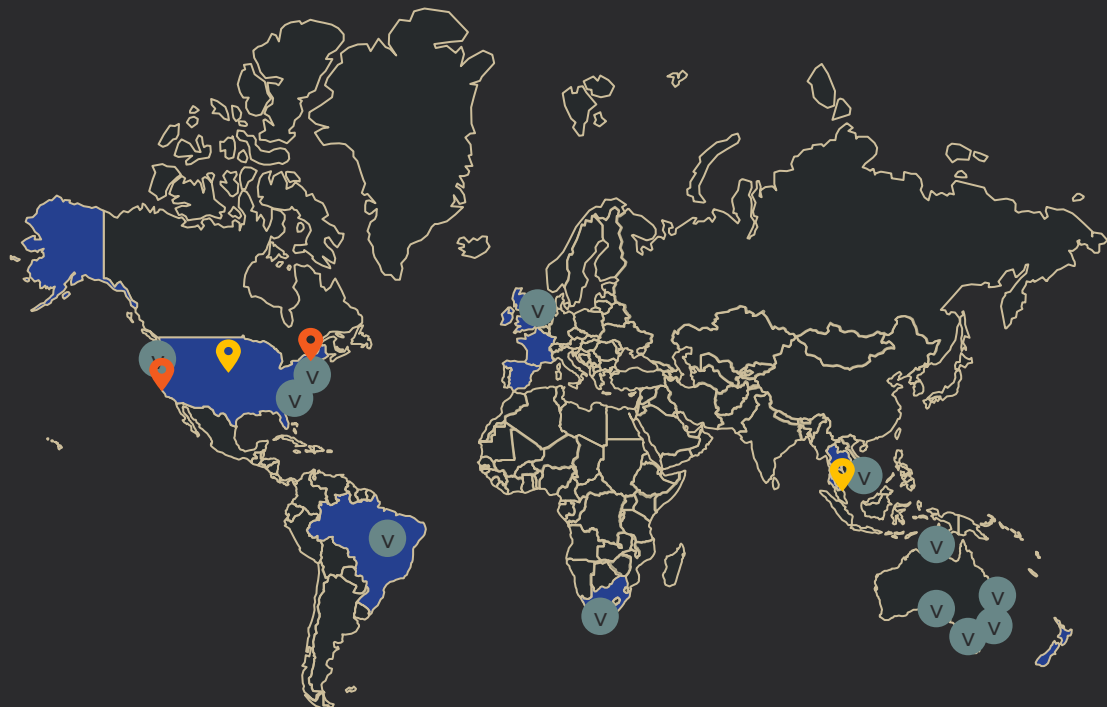
50m+

Kilometer. hours of
data collected



80TB

Data generated
per day



**Existing DFS[®]
locations**



City locations
Selected for city density and data
centre presence



R&D
Bay Area CA and NJ,
US



Networks Operations Centres
Singapore and USA

DigitalMarine™ delivers a key breakthrough in security and surveillance of submarine assets: Data in context to act upon



DEFENCE GRADE SECURITY AND SURVEILLANCE

up-to-the-minute detection of threats to your assets, whether accidental or intentional



REAL-TIME ACOUSTIC DETECTION AND CLASSIFICATIONS

of vessels and seabed events



INTEGRATION WITH AIS DATA

provides a seamless defense system via a single-pane-of-glass view



DISTRIBUTED ACOUSTIC SENSING

(seabed events, cable exposure, cable strumming) rounds out a complete threat detection stack

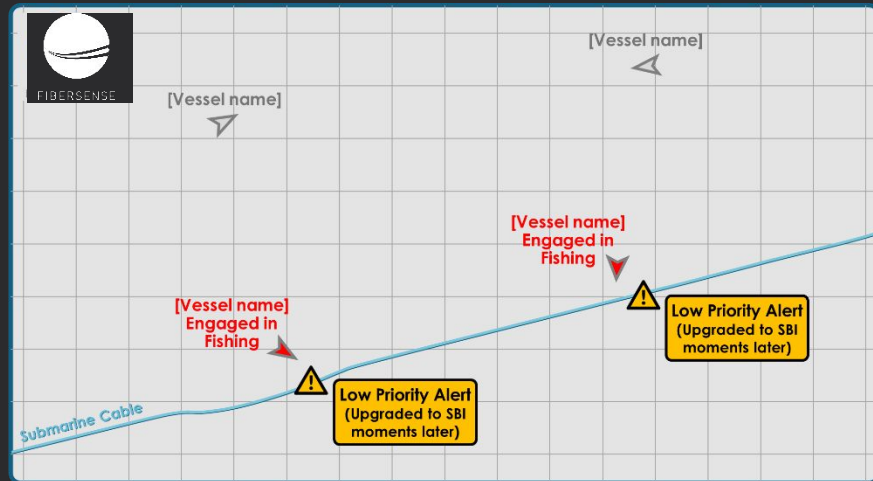
Operational Benefits of DigitalMarine™

- Ability to reduce risks of cable breaks to clients.
 - FiberSense has seen a 50+% reductions of breaks on assets year on year when using the services.
- Reduced downtime - Mean Time to Repair (MTTR) when operators can wait up to 6 months for a cable repair ship.
- Lower insurance premiums via risk visibility.

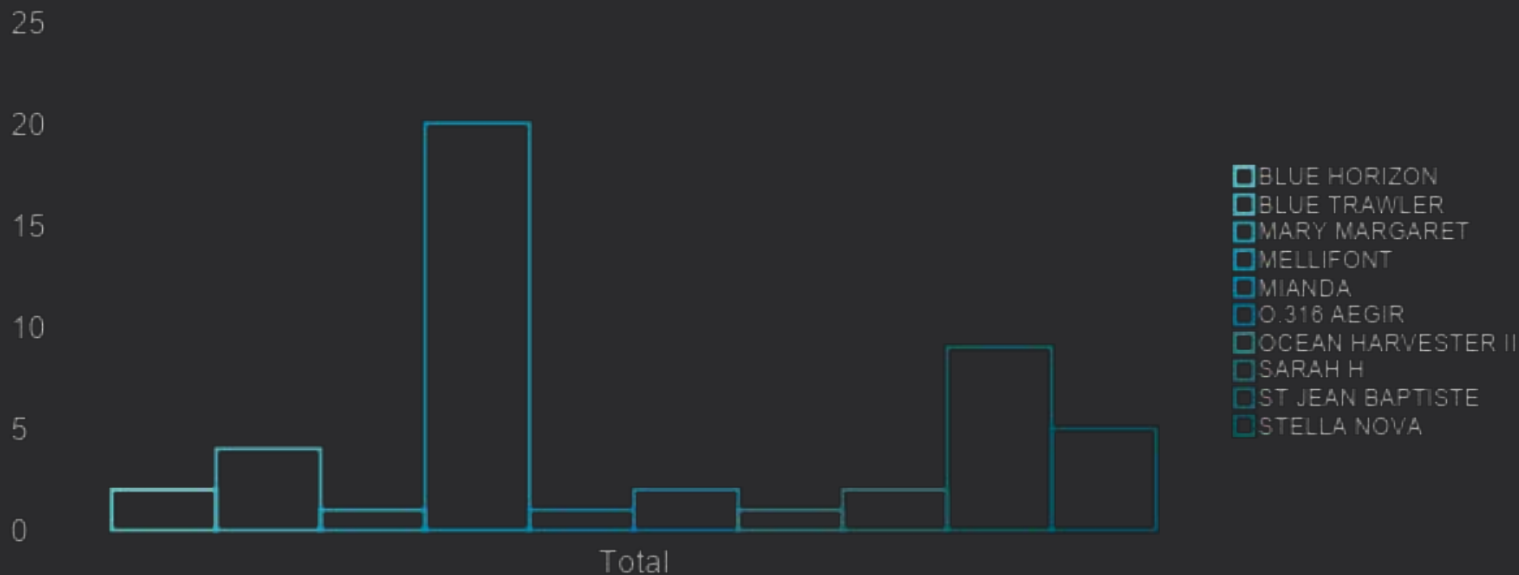
Detection Example

- Over four-months on a single cable, FiberSense reported:
 - 22 seabed interaction (SBI) events from DigitalMarine
 - 123,770 vessels in the area and 4,377 vessels 'Engaged in Fishing' from AIS
 - 215 low priority alerts for fishing close to the cable
 - 20 SBI for eight vessels (reported with identification)
 - Two SBI caused by illegal fishing

- Real-time notifications sent to the client using Portal/WhatsApp/email
 - Detailed event reports issued within 24 hours

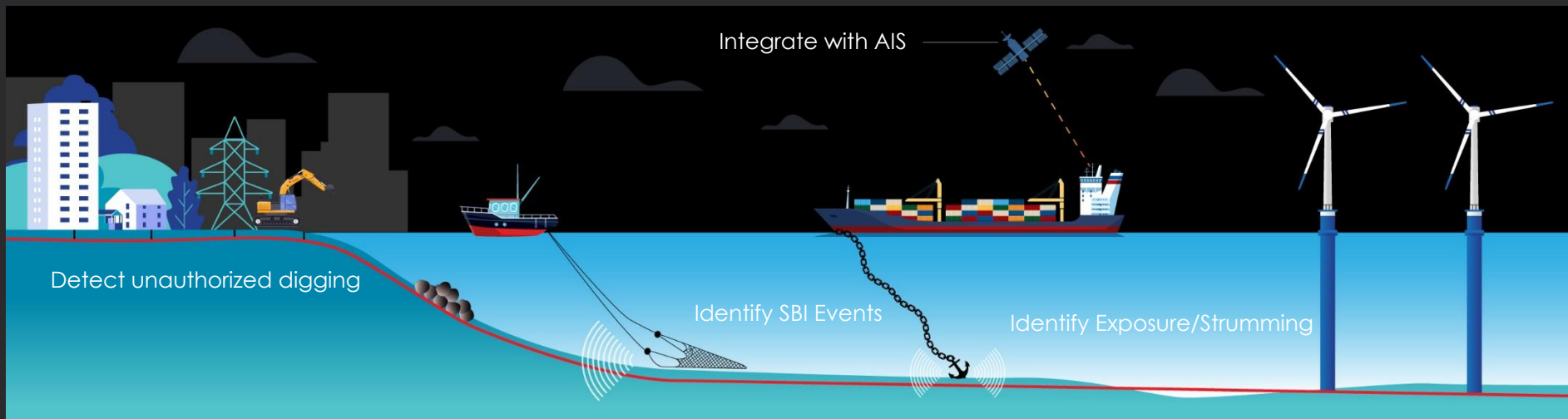


Repeat Rogue Fishing Vessels



Continuous situational awareness provides trending information to the operator.
Repeat offenders can be identified and engaged.

Real-time shore-end protection for subsea cables at scale



Fishing and anchoring, cable exposure, strumming and impacts of seismic events, subsea slides accurately identified, located and geofenced.



FIBERSENSE

GAME CHANGING REAL TIME DETECTION OF OBJECTS AND EVENTS

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