unseenlabs

Pioneer and global leader
in space-based RF detection

ESA Space for Arctic workshop

2-3 July 2024 - Tromsø, Norway

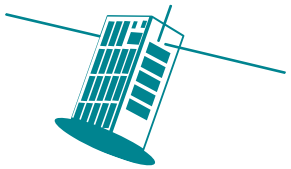
> About Unseenlabs

Who we are

A pioneer and global leader in space-based radio frequency detection

What we do

Detect, locate & track radio frequency signals, delivering mission-critical data and intelligence



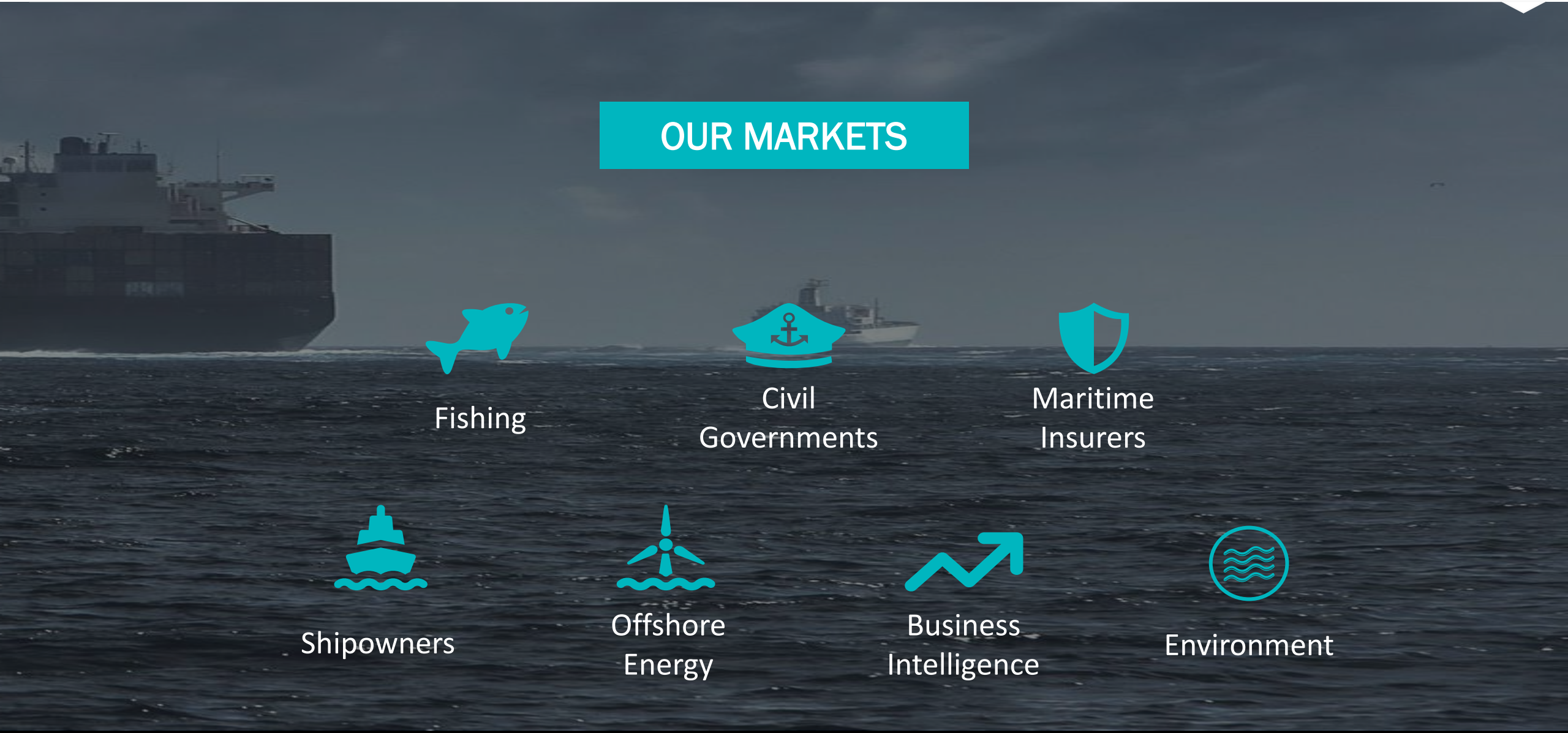
How we do it

Using a global satellite constellation powered by monosatellite technology, coupled with a powerful data engine

Key facts

European company created in 2015 and based in France - Satellites full operational capacity since 2019.
Fast growing business with a €85M series-C fundraising closed in 2024 – 80+ people today, over 100 by the end of FY2024

> A new layer of detection to better protect, alert and secure



> What is at stake?

> The problem and its stakes

the problem

Unknown vessels locations and missing routes

Critical information is **not** always **in open access**

Onboard security systems can be tampered

Fragmented base of **legacy surveillance solutions**

at stake

<2.9% of ocean under **Marine Protected Areas**

35% of vessels have an **unknown or inaccurate AIS information**

$36B annual economic loss from illegal, unreported and unregulated fishing

>600 tankers are part of the **“ghost fleet”**

that’s where we come in

- Get an exhaustive view of the actual maritime traffic
- Monitor and track illegal activities at sea
- Better identify dark vessel clusters and patterns

> We can see what other systems cannot

	Terrestrial		Space-based		
	Ground Radars	AIS/ VMS/ LRIT*	SAR(1)	Optical imagery	RF
All weather conditions	●	●	◑	○	●
Covered area of interest	◑	●	◑	○	●
Uncooperative asset detection	●	○	●	●	●
Unique and unfalsifiable fingerprint	●	○	○	◑	●
Easily implementable data	○	●	○	◑	●

Source: Company information & estimates. 1. Synthetic Aperture Radar; Automatic Identification System; Vessel Monitoring System; Long-Range Identification and Tracking

> Monitoring human activities in the Arctic region – a real challenge

Vast area to cover

The Arctic's immense and remote area makes consistent monitoring challenging.

Cloud Obstruction

Frequent clouds and polar nights hinder optical satellite observations.

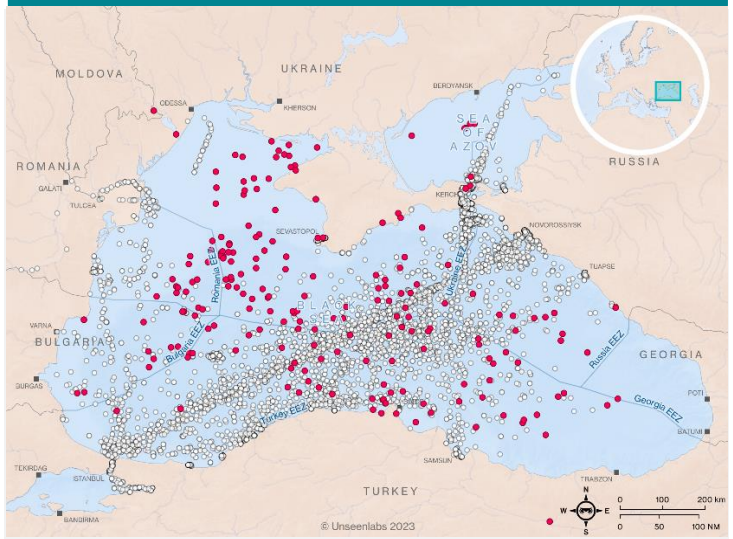
SAR Limitations

Lack of stable topography can complicate SAR satellite detection of vessels.

that’s where we come in

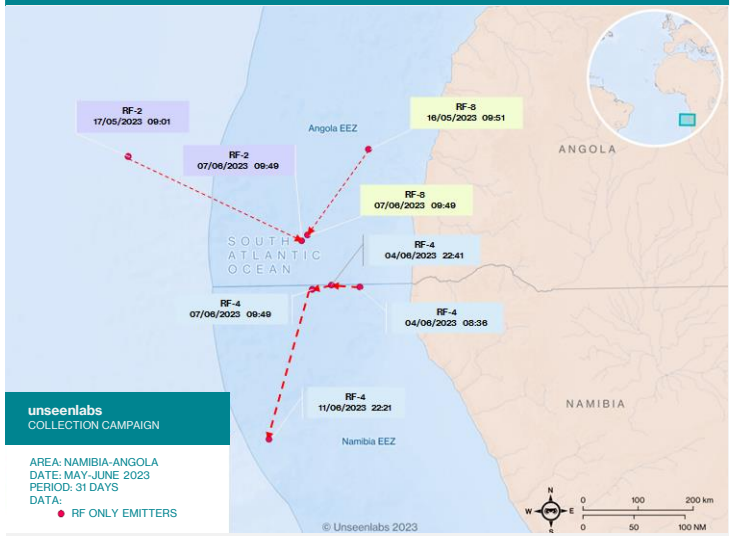
> How we help you protect your assets

AREA OF INTEREST



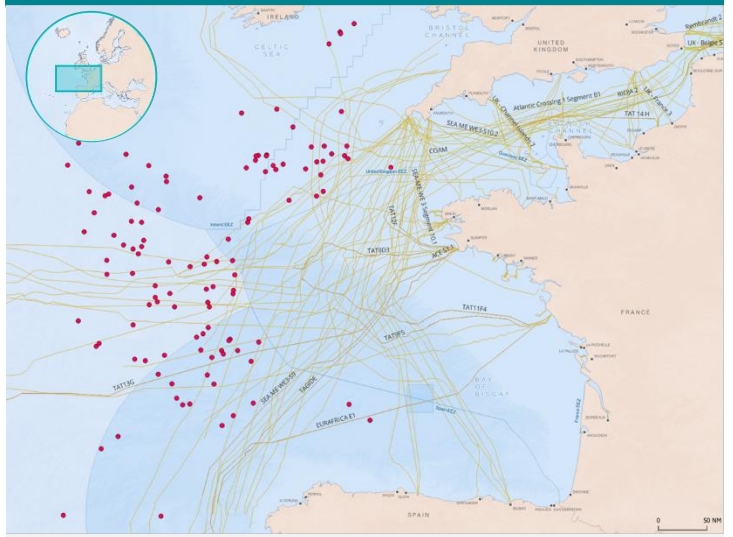
Monitoring of wide areas of interest for intelligence analysis

VESSEL OF INTEREST



Detection geolocation and tracking of ships via unique RF fingerprinting

ASSETS OF INTEREST



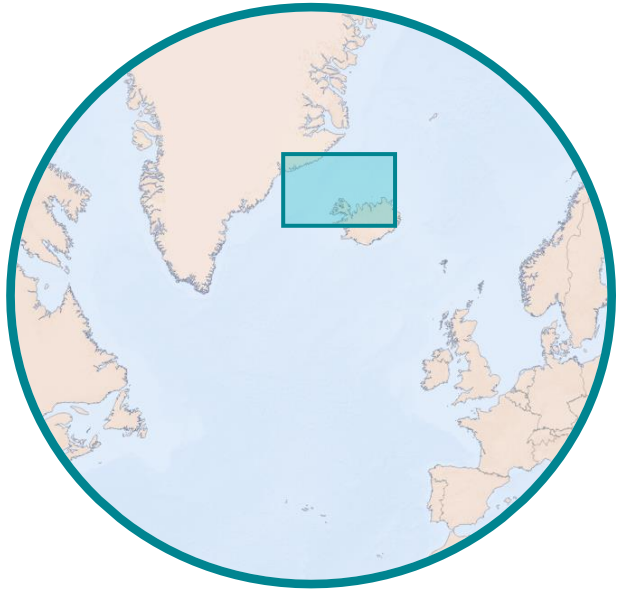
Geofence monitoring around strategic **offshore assets** (platforms, cables, etc.)

> Greenland sea

> RF collection campaign in the Greenland sea

RF COLLECTION CAMPAIGN

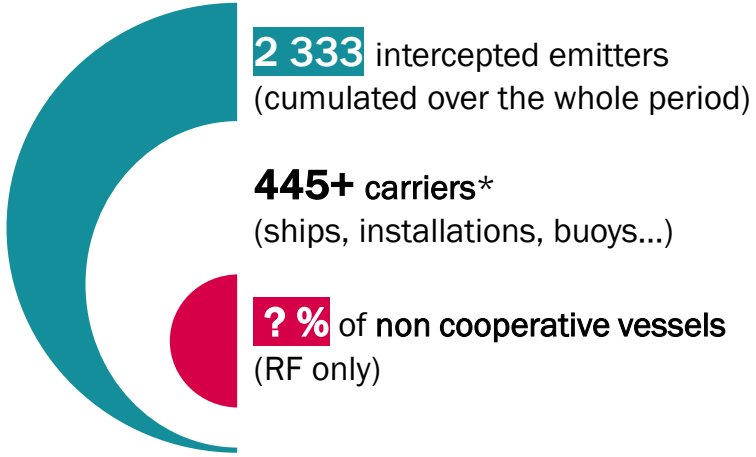
DATE:	**2022/06/01 – 30**
PERIOD:	**30 DAYS**
FOOTPRINT:	**300,000 km²**
# COLLECTIONS:	**85**
# REVISITS/DAY:	**2 to 3**



Objectives

Detection, identification and tracking of dark vessels in the area.

Key insights



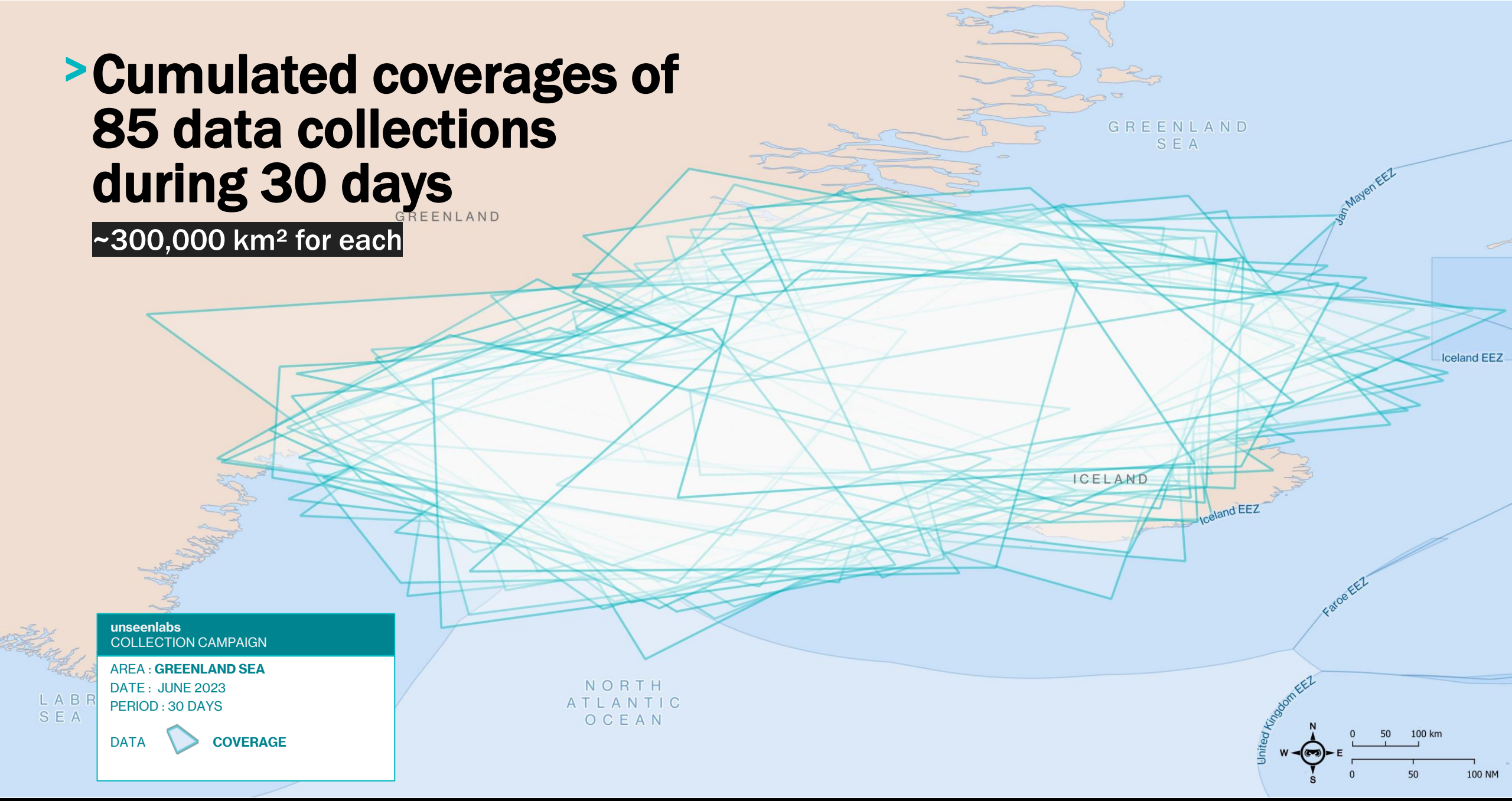
2 333 intercepted emitters (cumulated over the whole period)

445+ carriers* (ships, installations, buoys...)

? % of **non cooperative vessels** (RF only)

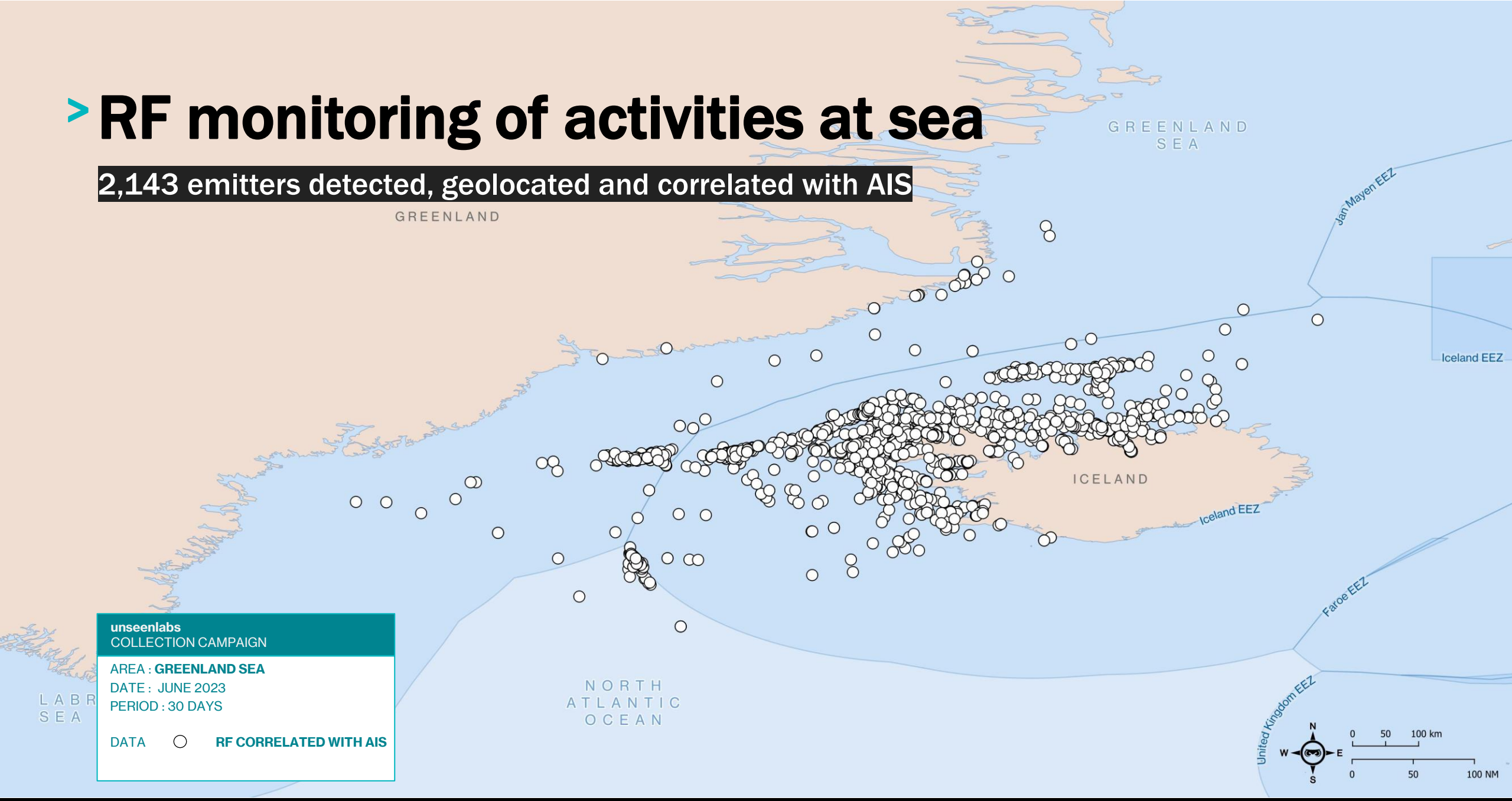
Cumulated coverages of 85 data collections during 30 days

~300,000 km² for each



> RF monitoring of activities at sea

2,143 emitters detected, geolocated and correlated with AIS

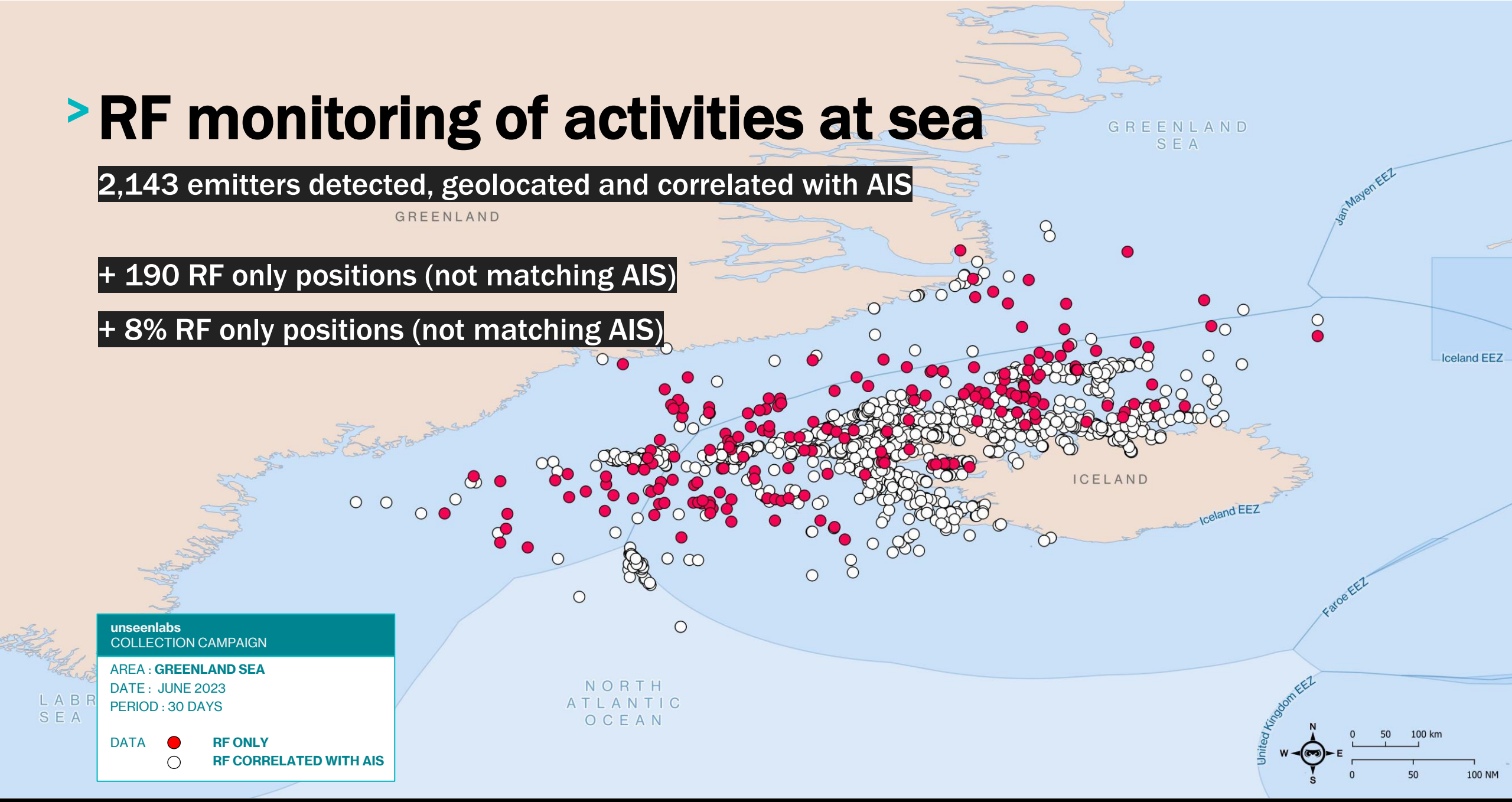


RF monitoring of activities at sea

2,143 emitters detected, geolocated and correlated with AIS

+ 190 RF only positions (not matching AIS)

+ 8% RF only positions (not matching AIS)



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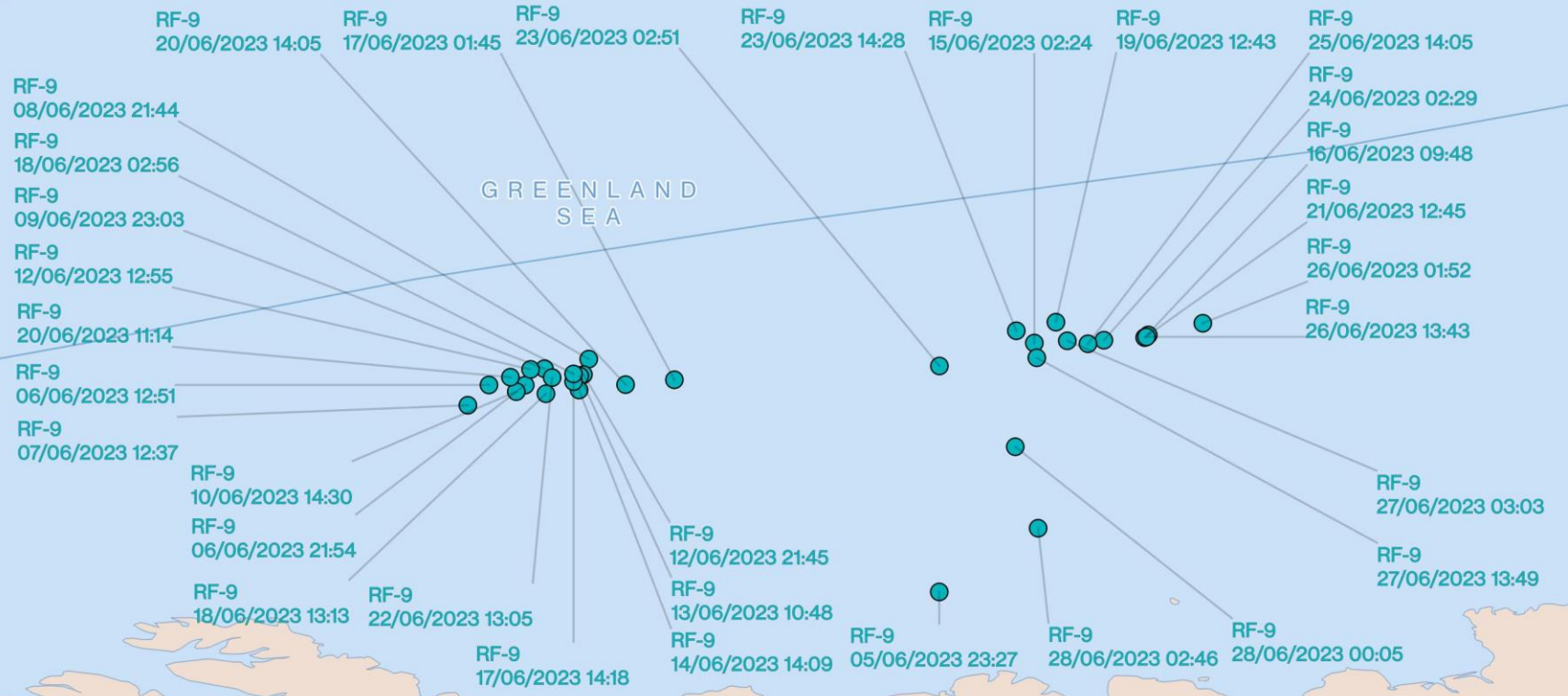
COLLECTION CAMPAIGN

AREA : **GREENLAND SEA**
DATE : JUNE 2023
PERIOD : 30 DAYS

DATA **RF EMITTERS**

RF vessel tracking example

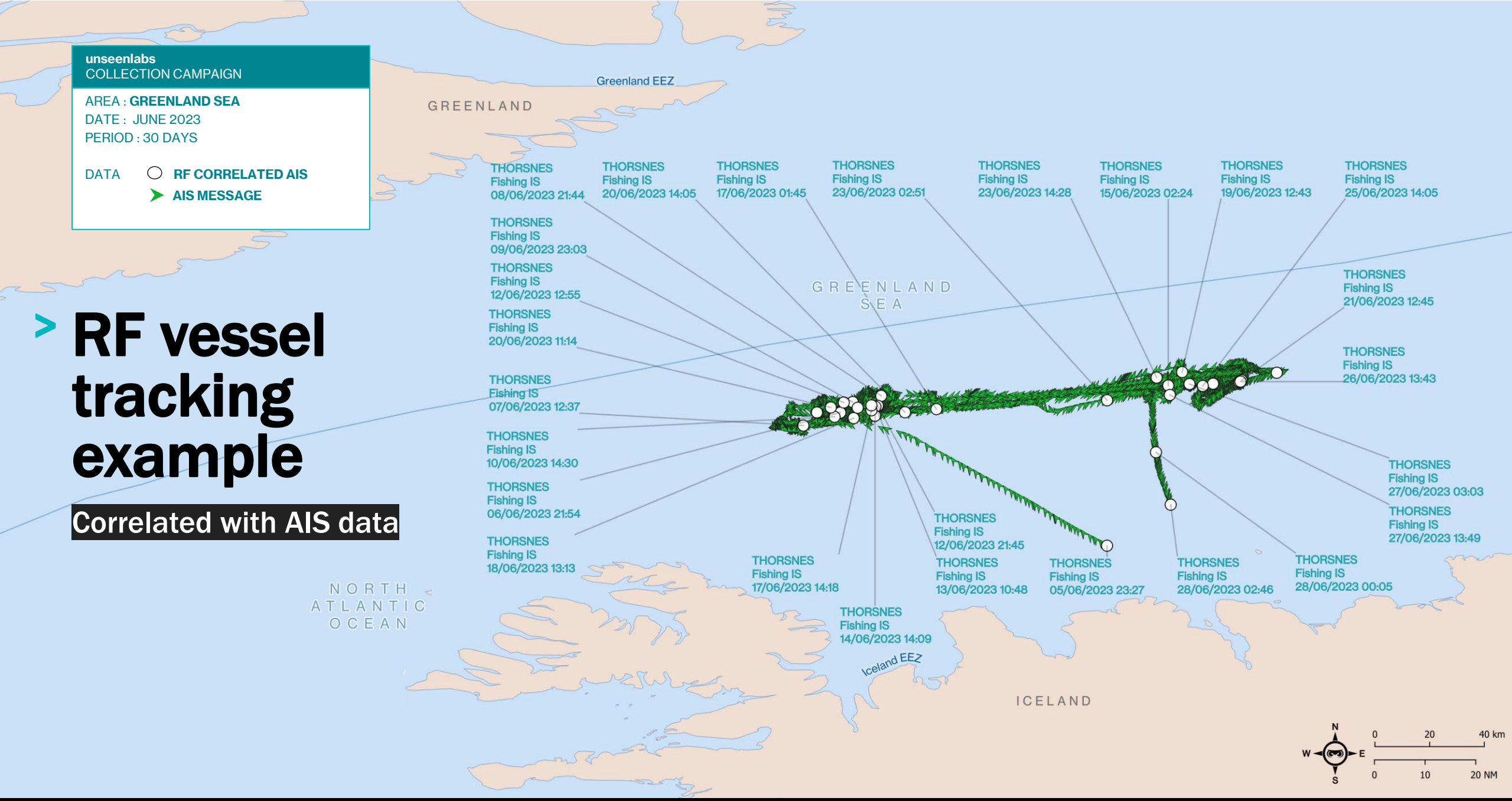
using space-based RF detection



Vessels emitters	# RF positions	RF Frequency	Other RF parameters	Waveform
RF-9	32	Similar	Identical	2748511.3

RF vessel tracking example

Correlated with AIS data



> Norwegian sea

> A fishing vessel

geolocated and located close to the Norwegian coasts

detected with Unseenlabs' space-based RF detection
switched off its AIS after leaving the shore

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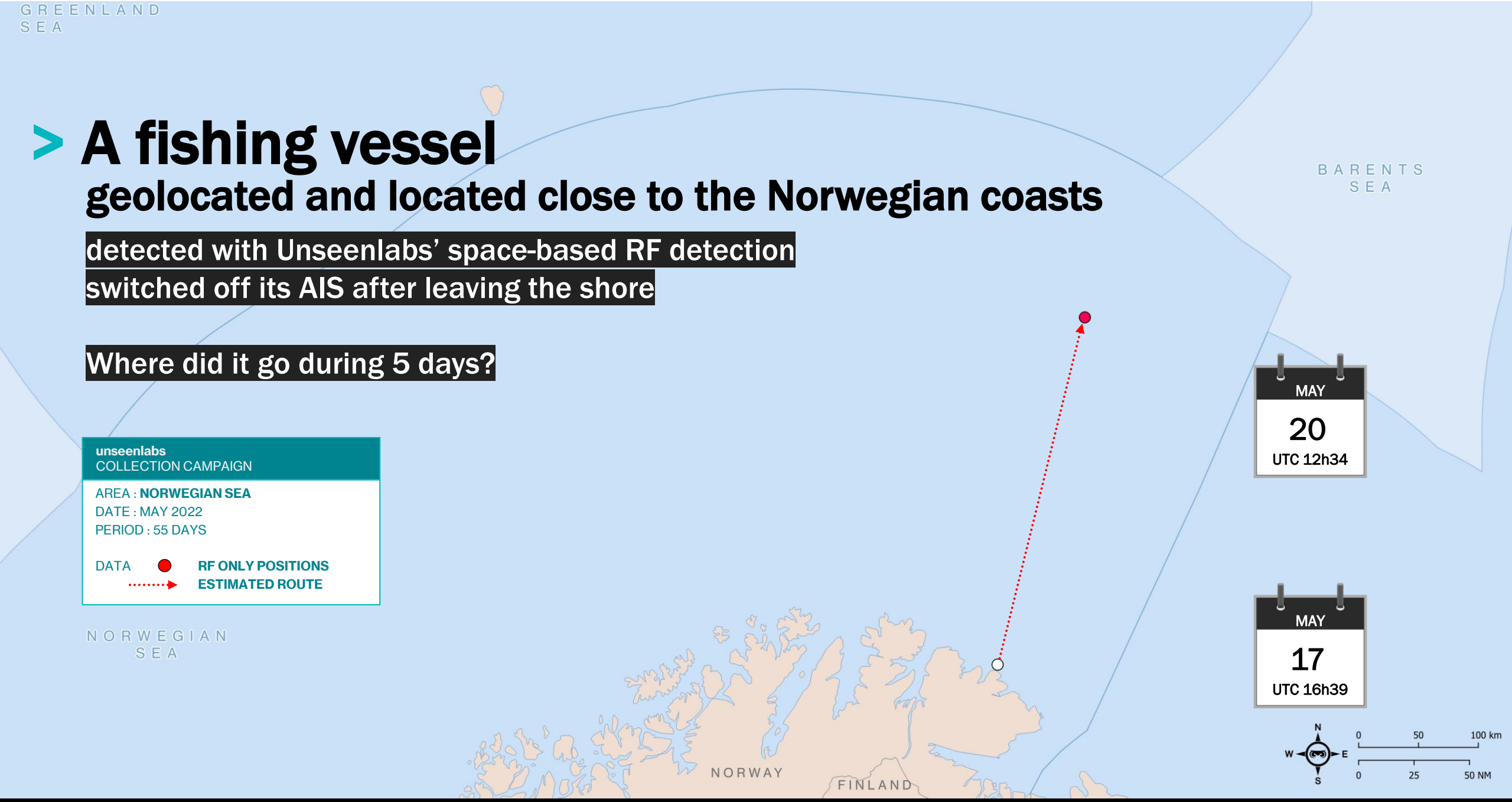
Where did it go during 5 days?



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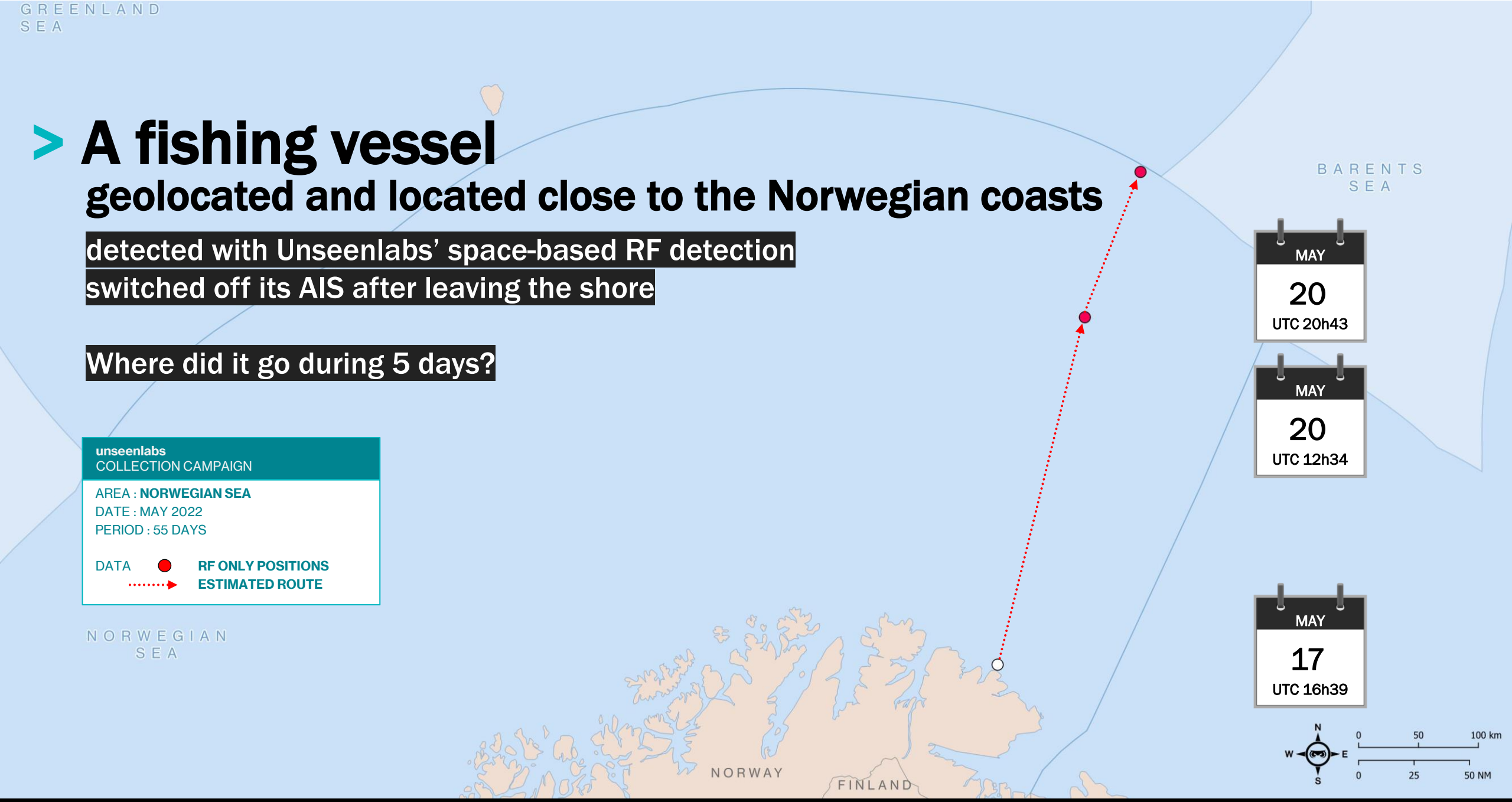

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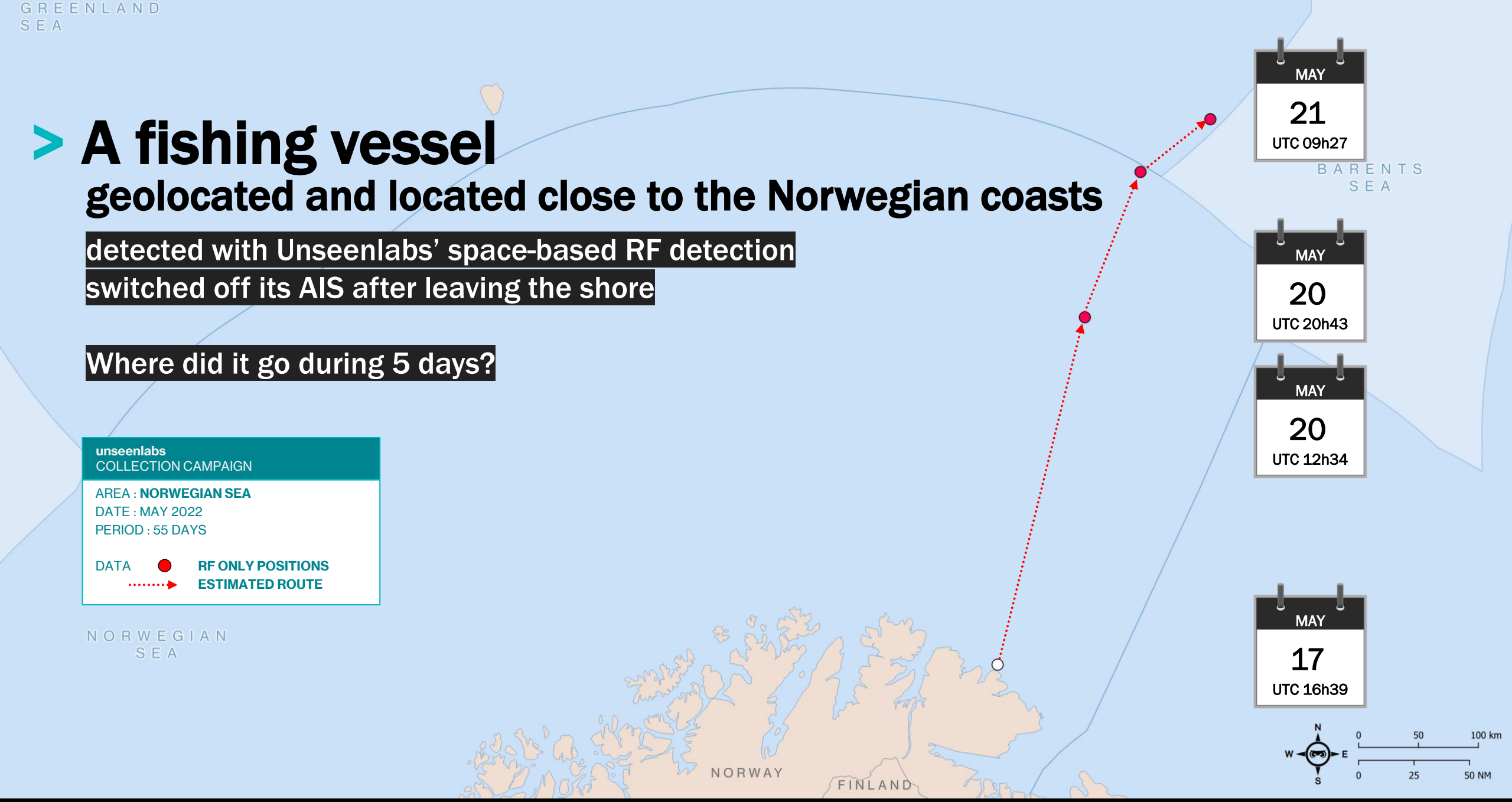
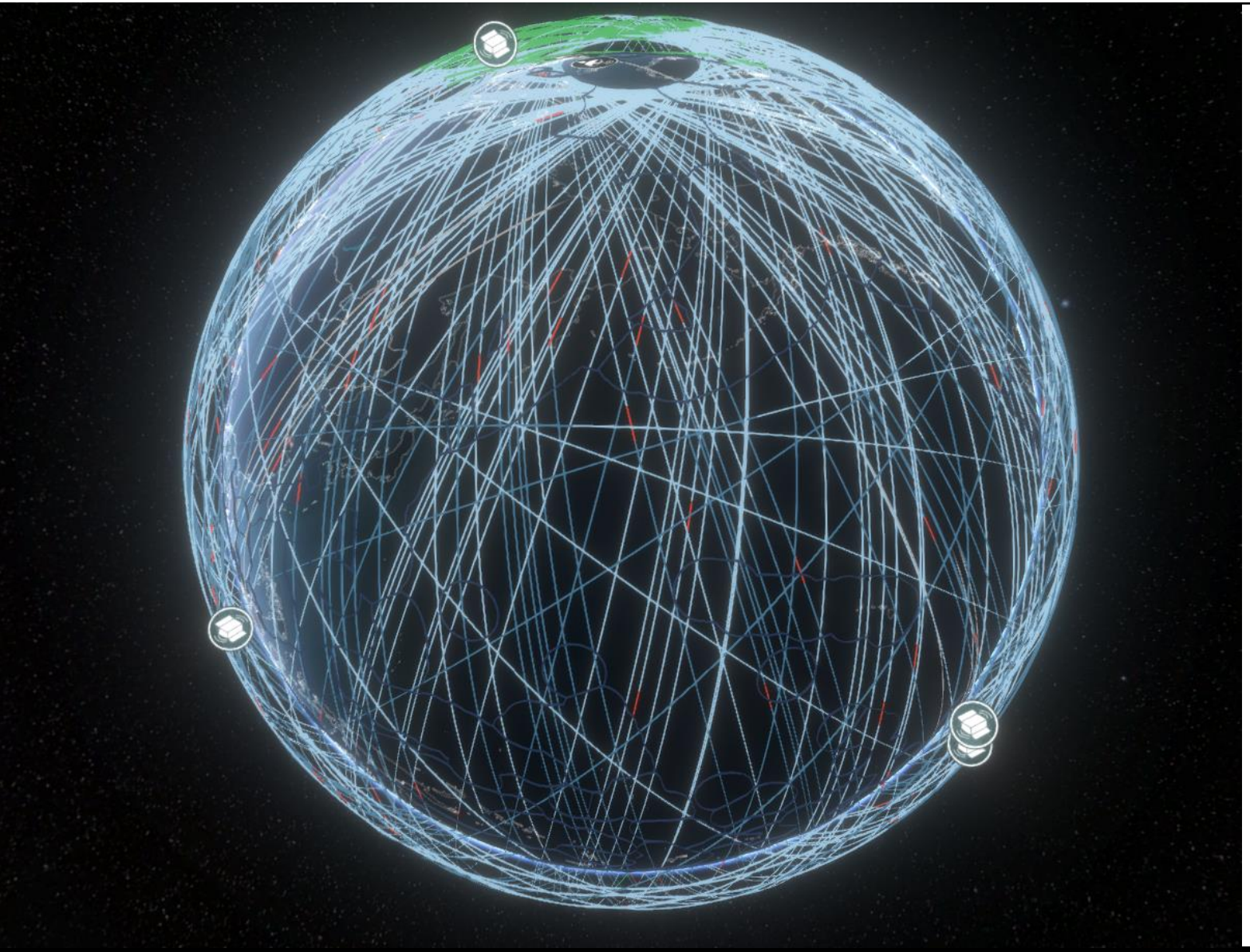


> Unseenlabs capacity



- With its 13 mono satellites, the artic area benefits from a **high revisit rate**

Up to 12 collections per day

- By the end of 2024,

the whole artic region will be covered by 20 to 25 collections per day.

> Our unique value proposition

1. **We can see where other systems cannot**
2. We are **the only RF monosatellite** space-proven actor
3. Our technology is **fully operational** and **future-proof**
4. We deliver **unique, reliable and high value-added** intelligence fast

Global, persistent coverage of RF signals

Sub-kilometer **accuracy**

Lightweight data and intelligence

Interoperability with other Earth observation solutions

Unique RF fingerprinting assignment

Fast time delivery
for mission-critical decision making

> Next steps ?

- Collaborate with other complementary systems and solutions to better answer the user needs
  - Radar/Optical Imagery analyst
  - AIS spoofing detectors
  - Integrated multi-source systems

    ...

> We see the unseen

Contact us

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More information at

www.unseenlabs.space / @Unseenlabs