

EFCA

European Fisheries Control Agency

Cyber threats

A growing concern for the fishing industry

**EU Coastguard Cybersecurity
Working Group (ECCWG)**

Brussels 23-24 May 2023



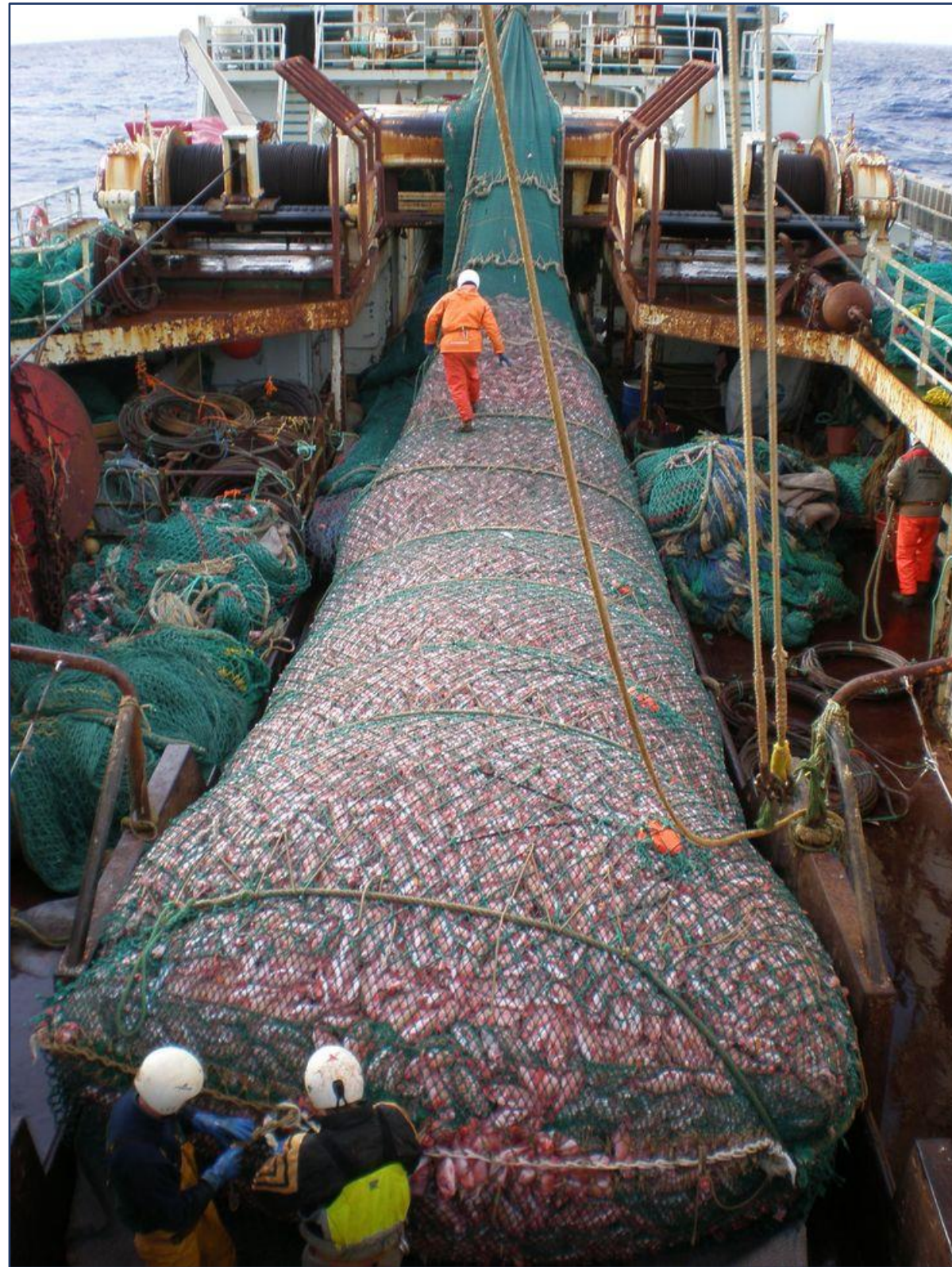
Sven TAHON
European Fisheries Control Agency

The fishing industry today

- **High-tech:** Navigation, fishing & processing technologies
Communication, Fisheries MCS
- **Complex:** Remote areas, dangerous fishing grounds, fisheries restrictions
- **Global:** EU fleet is fishing worldwide
Economic viability depends on transport & market technologies

Cyber threats a growing concern for the fishing industry

Fishing today



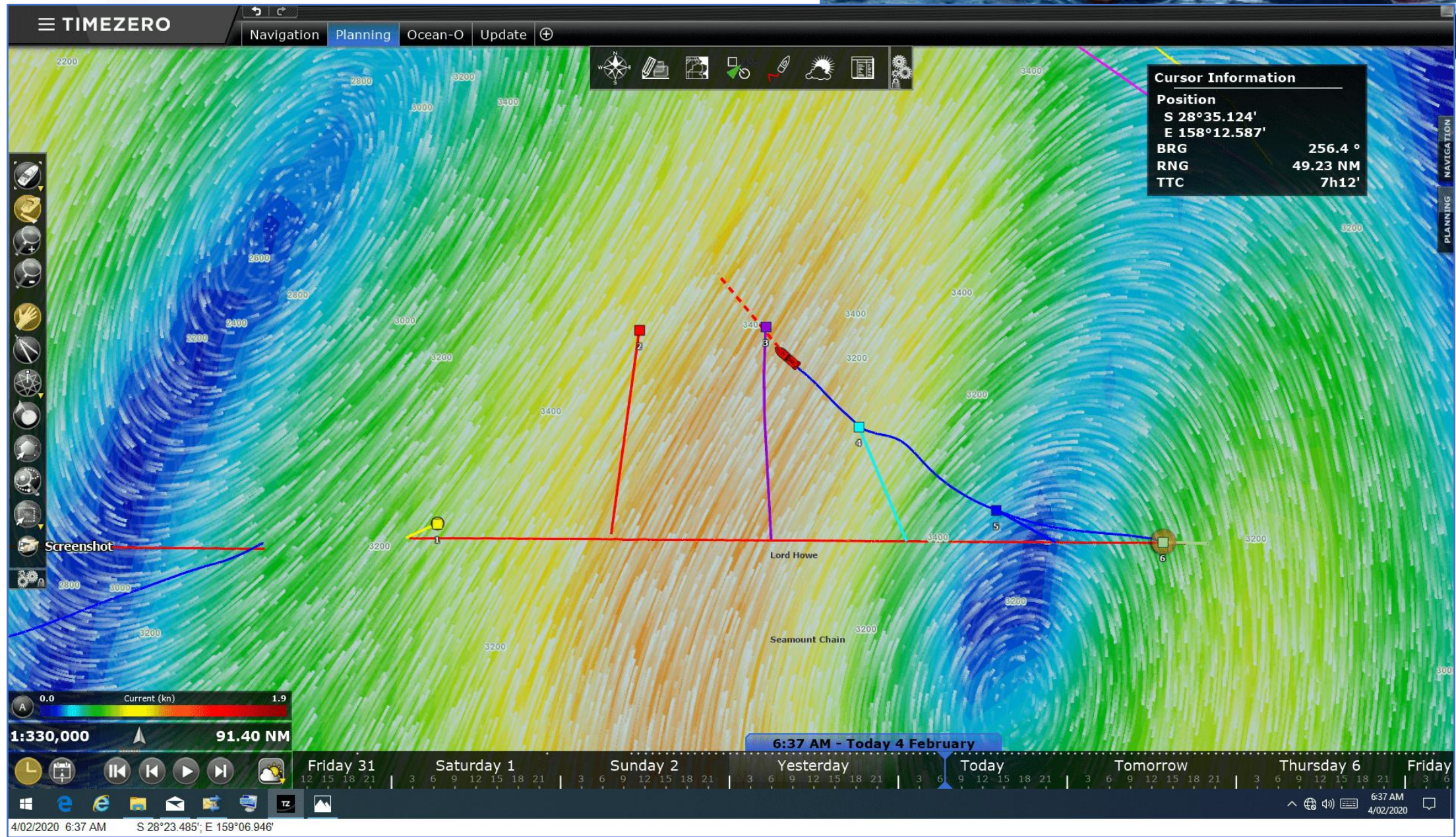
Cyber threats a growing concern for the fishing industry

High-tech: navigation



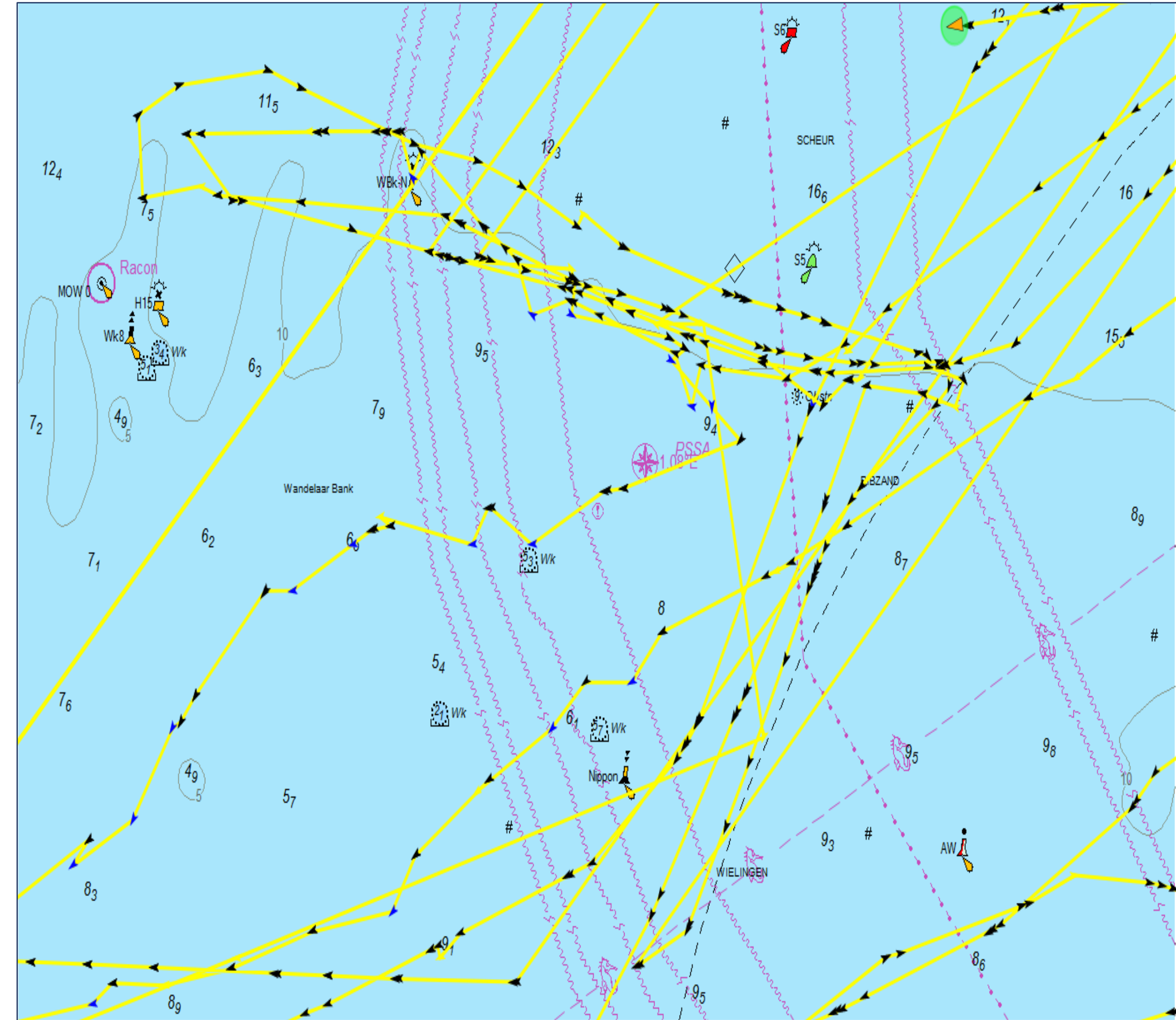
Cyber threats a growing concern for the fishing industry

High-tech: fishing



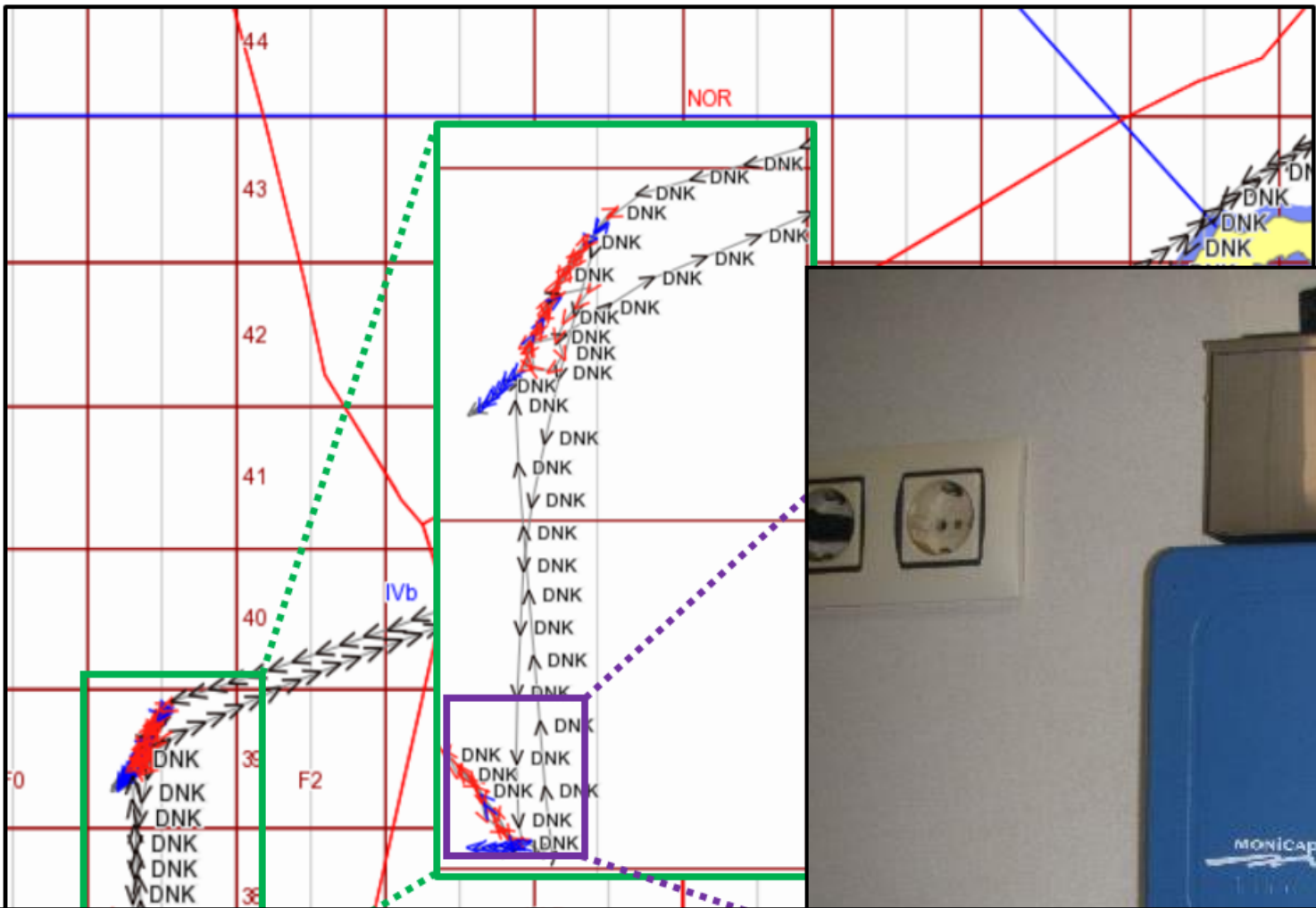
GNSS driven fisheries

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- A photograph of a fish trap, likely a cast net, set up in a shallow, rocky area. The trap is made of a fine mesh and is surrounded by a wooden frame. Several fish are visible inside the trap, and one fish is shown swimming away from the trap.



GNSS driven fisheries MCS

- Vessel Monitoring System (VMS)
Regulation (EC) No1224/2009 Art. 9
- Automatic Identification System (T-AIS & Sat-AIS)
Regulation (EC) No1224/2009 Art. 10
- Electronic Recording and Reporting System (ERS)
Regulation (EC) No1224/2009 Art. 15



EFCA ERS Electronic Reporting System

From Departure to Landing

Exchange Data Viewer Reports Business Rules Reference data Vessel groups Scenarios GIS Administration

Search criteria: Last declaration All declarations

Time frame: From 01/01/2012 To 04/10/2012

Flag vessel: ABW Aruba

Vessel group: AnotherGroup

Vessel identifier: Select vessels

Name: []

Species: AAA Adriatic sturge

Gear Type: DRB-Boat dredges

Status: On

Declarations of type: LOG SAL TRN

Criteria: From 01/01/2012 To 04/10/2012

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Query results:

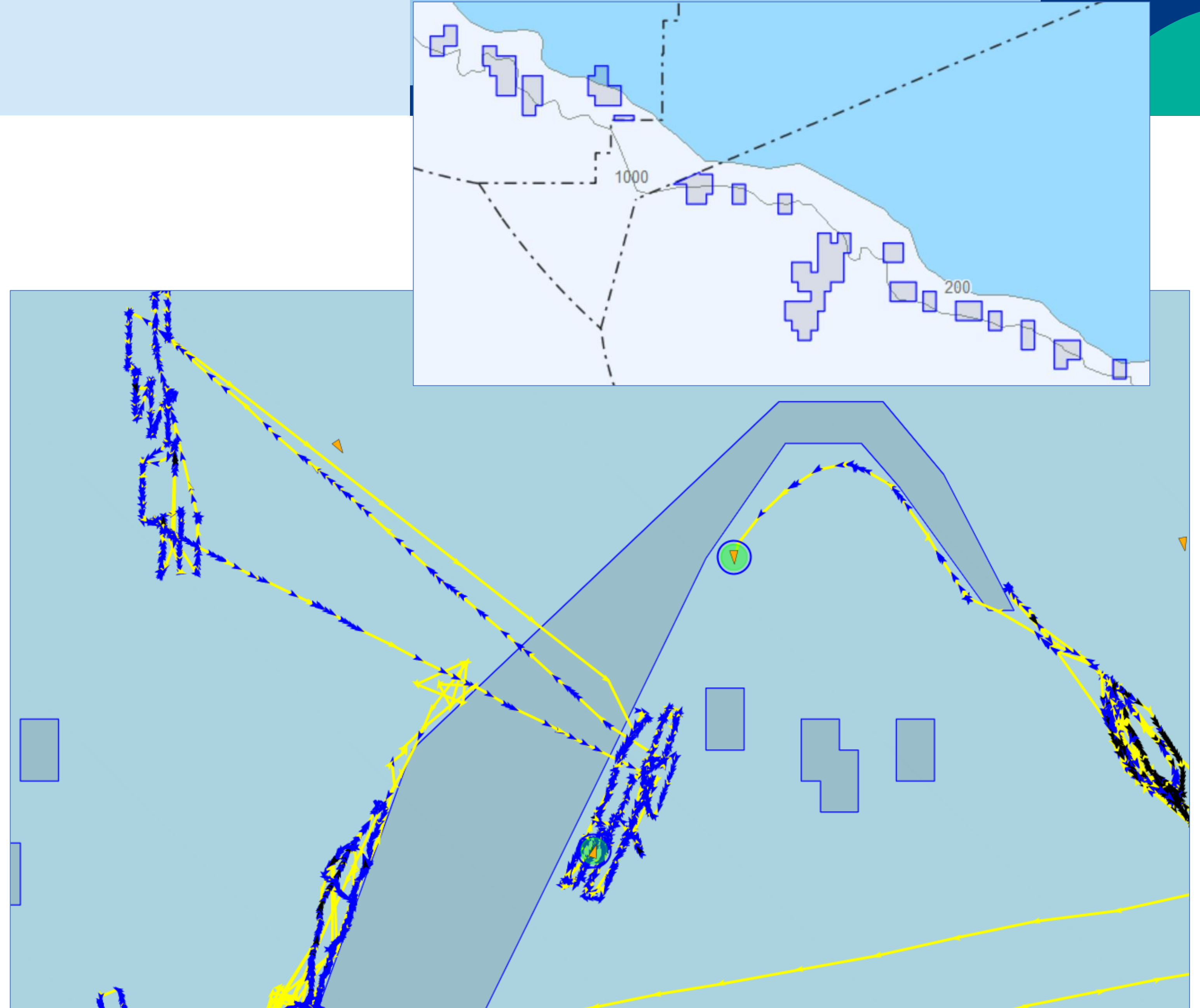
Name	Vessel IR	IRCS	XR	Dec type	Dec time	Dec received	View declara
[]	SWE0000000			DEP	2012/05/10 19:2	2012/10/03 11:3	[]
[]	SWE0000000			RTP	2012/05/11 12:0	2012/10/03 11:3	[]
[]	SWE0000000			DEP	2012/05/17 06:2	2012/10/03 11:3	[]
[]	SWE0000000			RTP	2012/05/17 12:0	2012/10/03 11:3	[]
[]	SWE0000000			DEP	2012/06/12 16:4	2012/10/03 11:3	[]
[]	SWE0000000			RTP	2012/06/12 20:5	2012/10/03 11:3	[]
[]	SWE0000000			DEP	2012/06/15 16:3	2012/10/03 11:3	[]
[]	SWE0000000			FAR	2012/06/17 06:0	2012/10/03 11:3	[]
[]	SWE0000000			FAR	2012/06/17 13:0	2012/10/03 11:3	[]
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[]	SWE0000000			FAR	2012/06/17 17:0	2012/10/03 11:3	[]
[]	SWE0000000			EOF	2012/06/17 18:2	2012/10/03 11:3	[]
[]	SWE0000000			RTP	2012/06/19 02:0	2012/10/03 11:3	[]
[]	SWE0000000			PNO	2012/06/19 04:0	2012/10/03 11:3	[]
[]	SWE0000000			LAN	2012/06/19 04:3	2012/10/03 11:3	[]
[]	SWE0000000			DEP	2012/06/19 12:3	2012/10/03 11:3	[]
[]	SWE0000000			RTP	2012/06/19 19:0	2012/10/03 11:3	[]
[]	SWE0000000			DEP	2012/08/04 12:0	2012/10/03 11:3	[]
[]	SWE0000000			RTP	2012/08/04 17:3	2012/10/03 11:3	[]
[]	SWE0000000			DEP	2012/08/05 09:0	2012/10/03 11:3	[]

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GNSS driven MCS

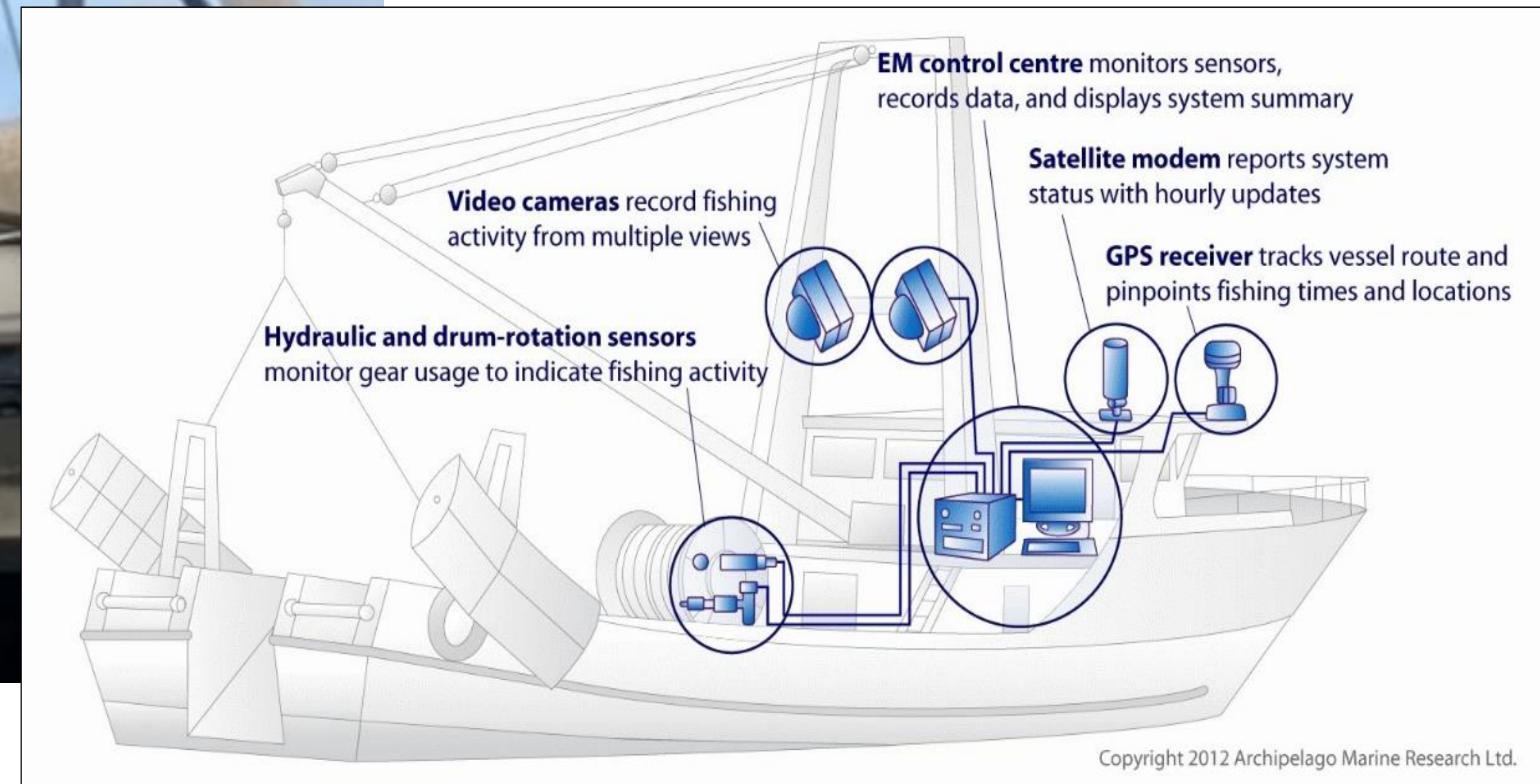
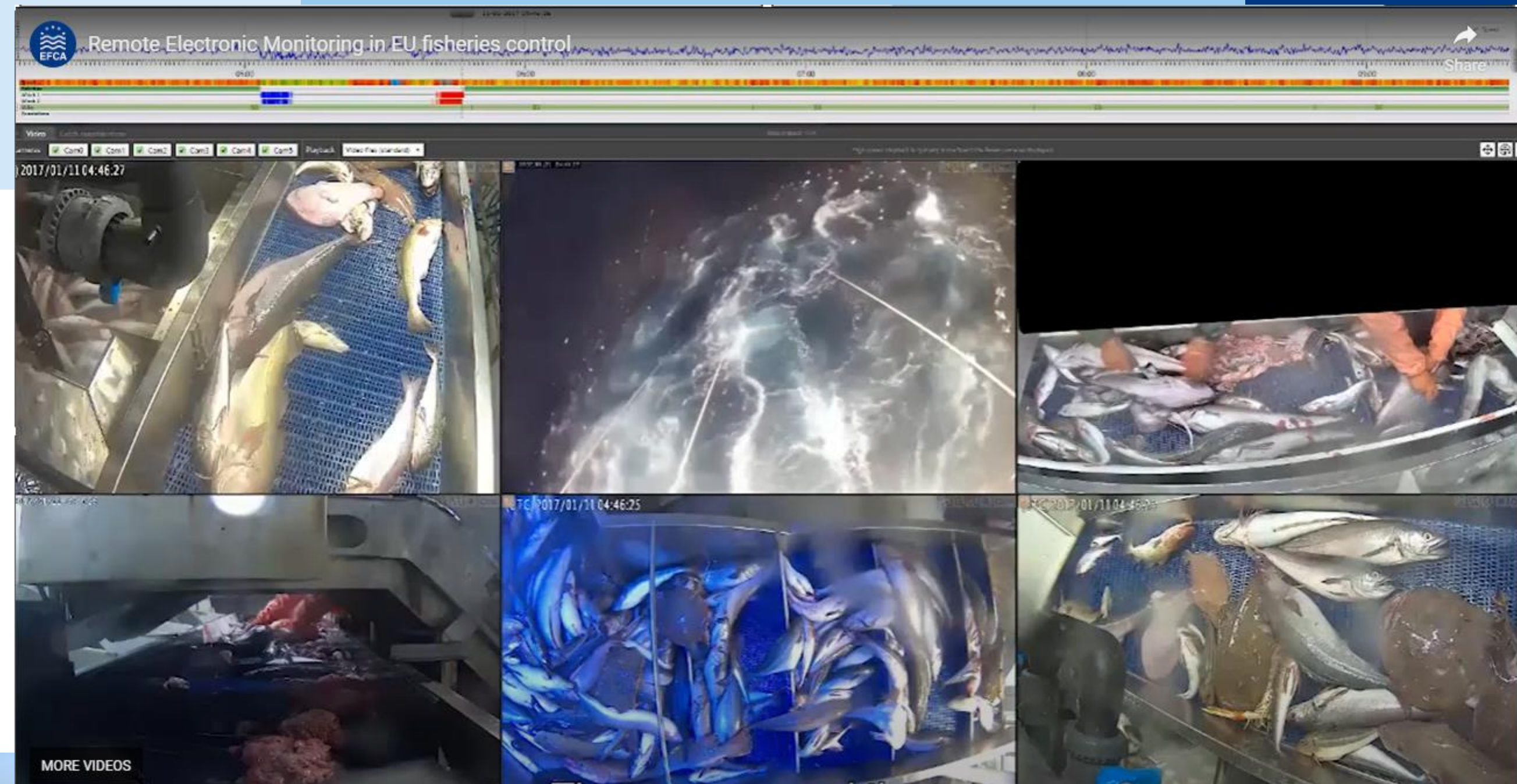
- Effort & activity monitoring
- Fisheries restricted areas (FRA's) & Real Time Closures (RTC's)



GNSS driven reporting

- Other reporting obligations:
 - Prior-notification
 - Transshipment declaration
 - RFMO reporting obligations
 - REM data

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Electronic market systems

- High dependency on online auction systems
- Perishable product quality dependent price setting
- Limited storage capacities



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- Our catch registration system [Pefa eLog](#) gives fishermen access to landing information from these auctions.
- If you work at an auction and want to join Pefa and use our Pefa Auction service, visit our general [Pefa Auction](#) page.

Yerseke (NL)

Stockholm (SE)

Cattolica (IT)

Stellendam (NL)

Scheveningen (NL)

Den Oever (NL)

Hvide Sande (DK)

Thyborøn (DK)

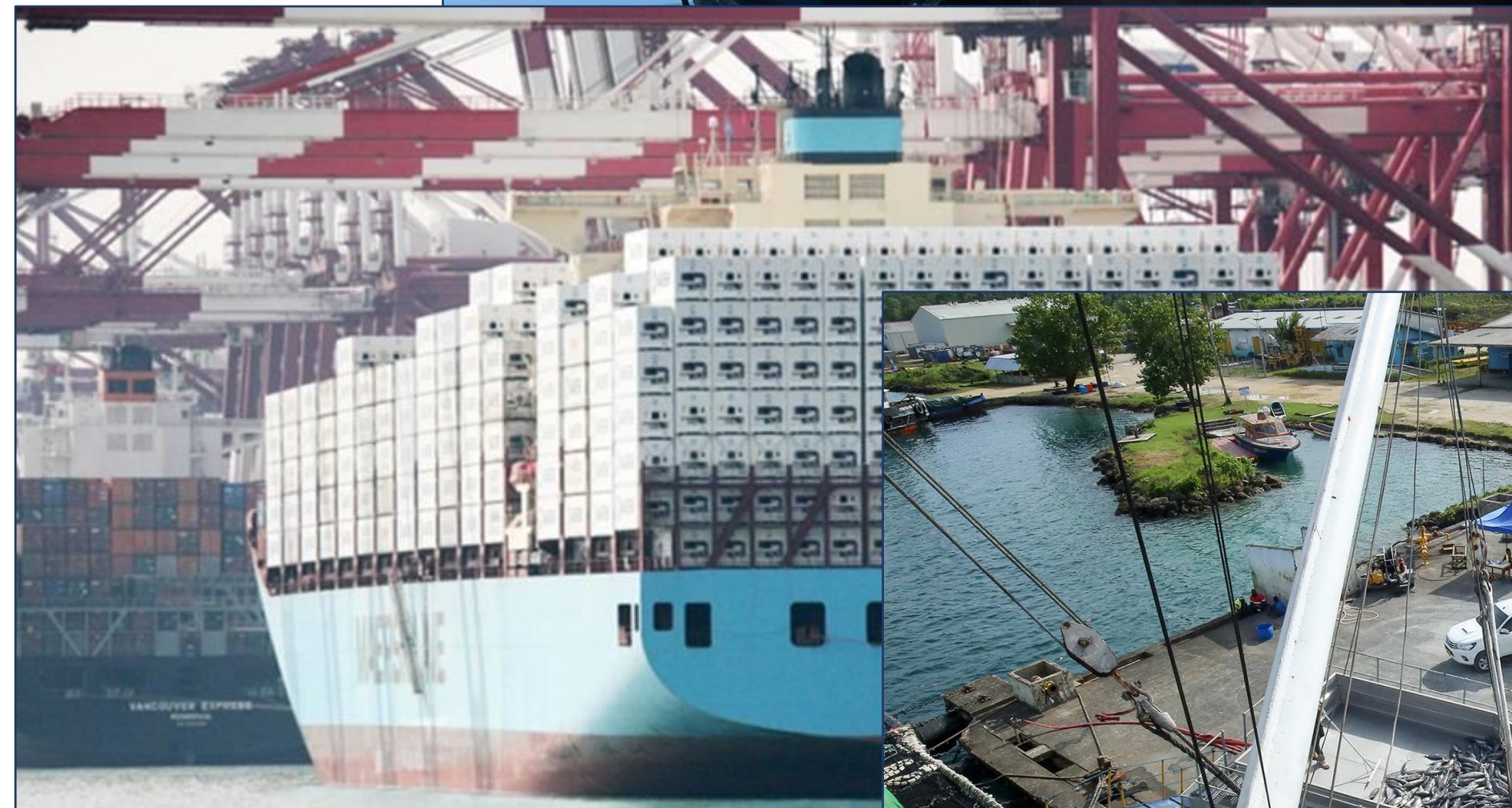
Smögen (SE)

Gilleleje (DK)



Transport

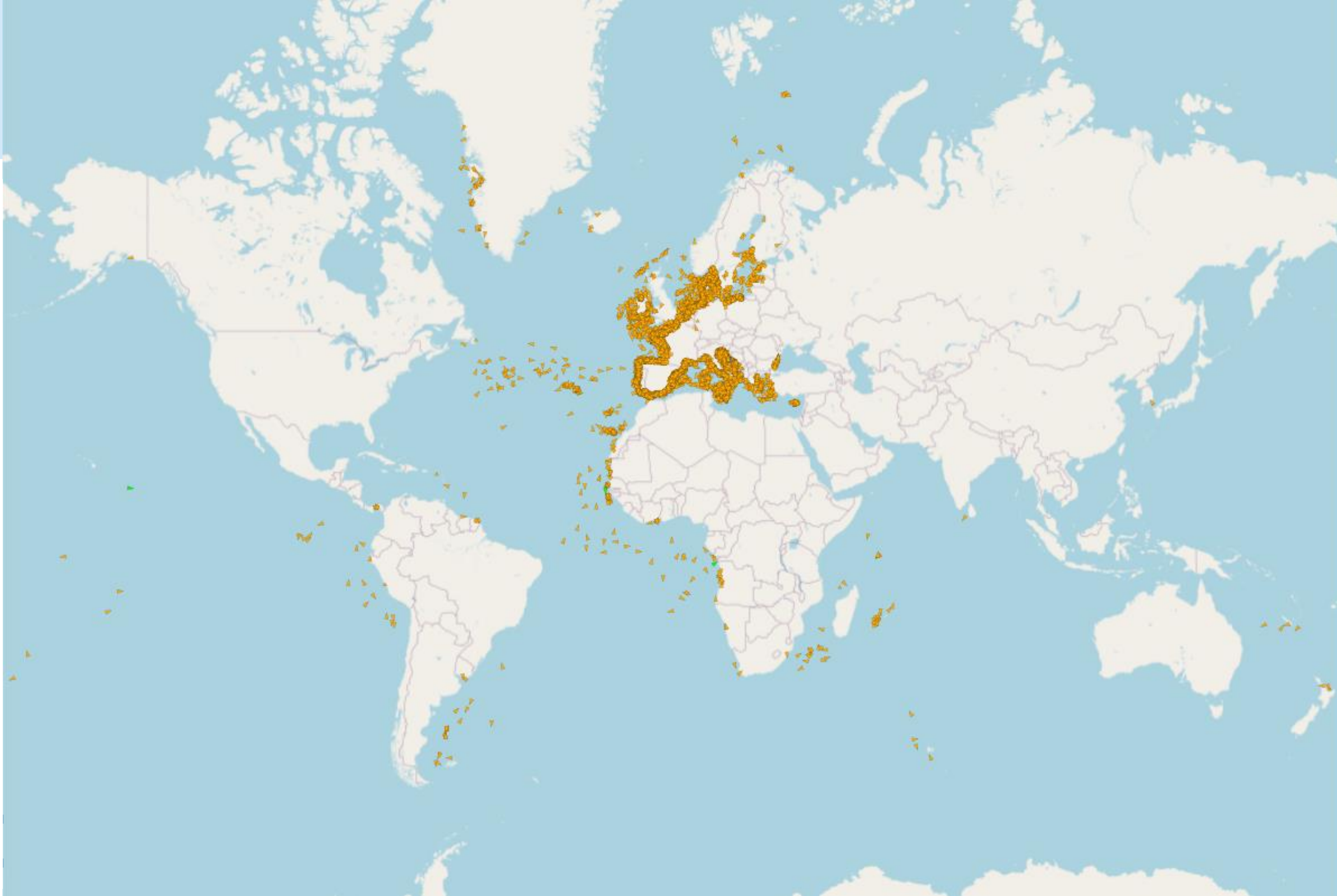
- Transport & transshipment communications
- Computerized cooling systems
- Computerized tracking systems
- Reporting obligations (Transshipment & Transport declarations) processing



Cyber threats a growing concern for the fishing industry

Global

- EU fishing fleet activity
- EU fish trading activity



Cyber threats a growing concern for the fishing industry

Global

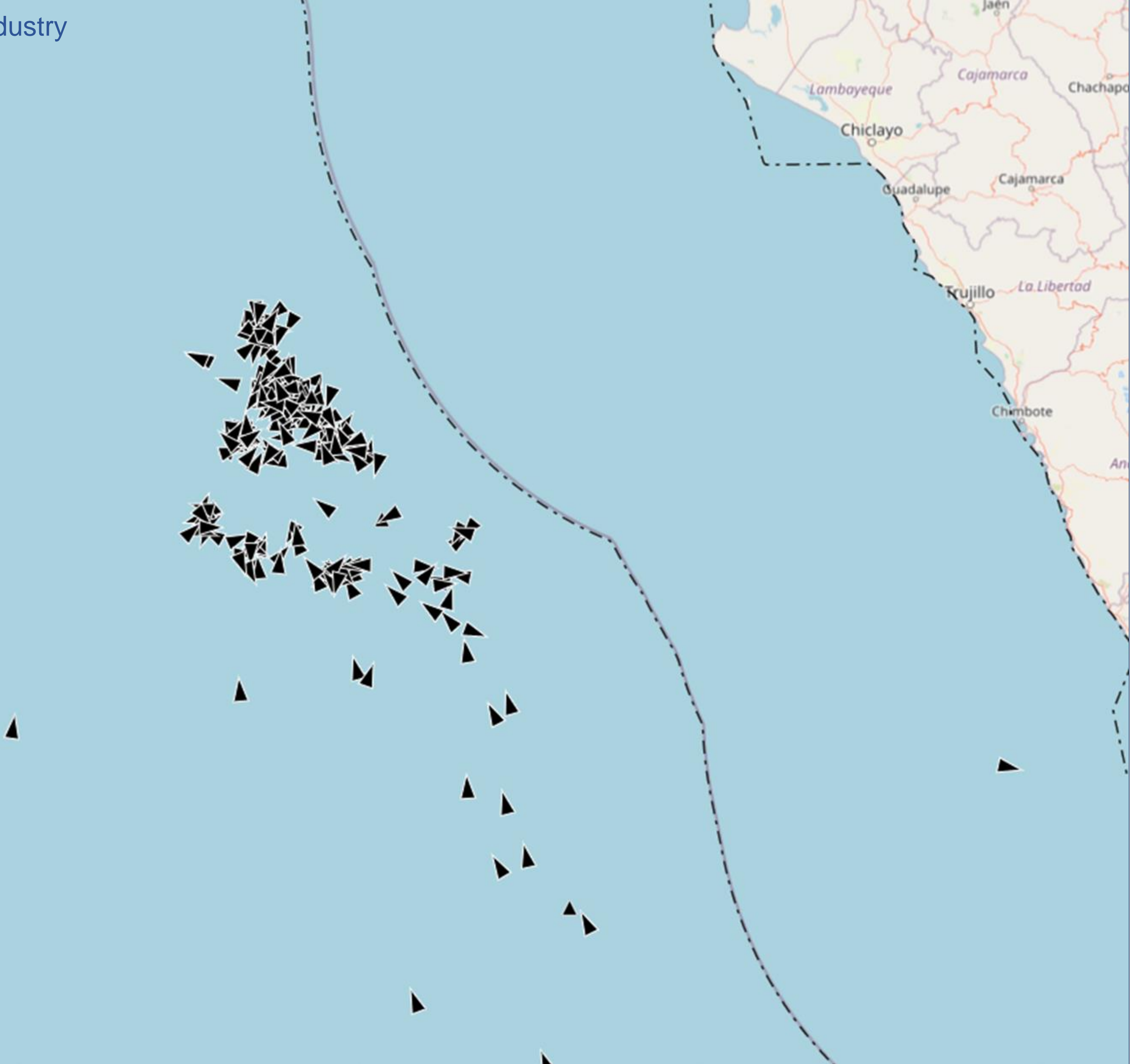
Example: EU Fleet off Peruvian Coast



Cyber threats a growing concern for the fishing industry

Global

Example: EU + Chinese Fleet off Peruvian Coast



Main Cyber Threats

- GNSS jamming/spoofing
- Data theft
- System disruption (ransom)

Example: North Korea jamming

April 1, 2016

N-waters of South Korea GPS navigation systems were jammed

- About 280 South Korean vessels experienced problems with their GPS & many were forced to return to port
- The disruption affected the fishing boats by making the GPS signal disappear from time to time throughout the day
- It came hours after North Korea fired a short-range missile into the sea, angry at ongoing U.S joint military drills with South Korea.
- Warning messages were broadcasted in affected areas warning ships to not rely on their GPS navigation



EFCA Role

- Mapping & reporting cyber threat cases specifically related to the fishing industry
- Support to projects developing innovative technologies for the mitigation of cyber threats
- Assessing potential cyber threats to existing reporting and monitoring systems

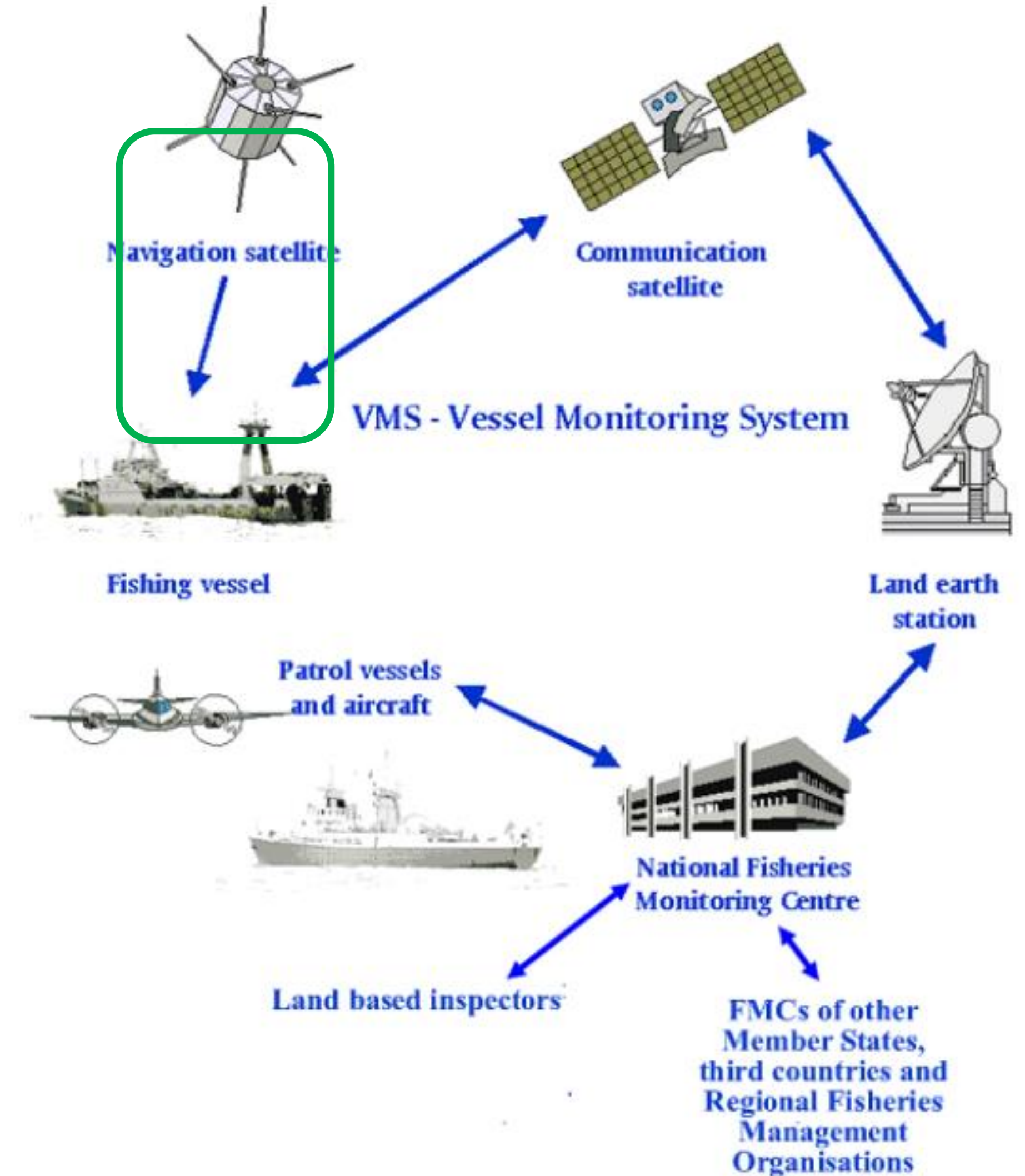
Cooperation with EUSPA

Resilience of the VMS.

Jamming: interference detected at FMCs
Spoofing: new cybersecurity vulnerability difficult to detect.

Main driver for the use of Galileo is its new service providing authentication of the transmitted information.

The VMS will know if the data collected to compute the position is genuine & will mark the message sent via the communication satellite as position authenticated.





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Thank you

