LuxSpace SAT – AIS Applications and Services

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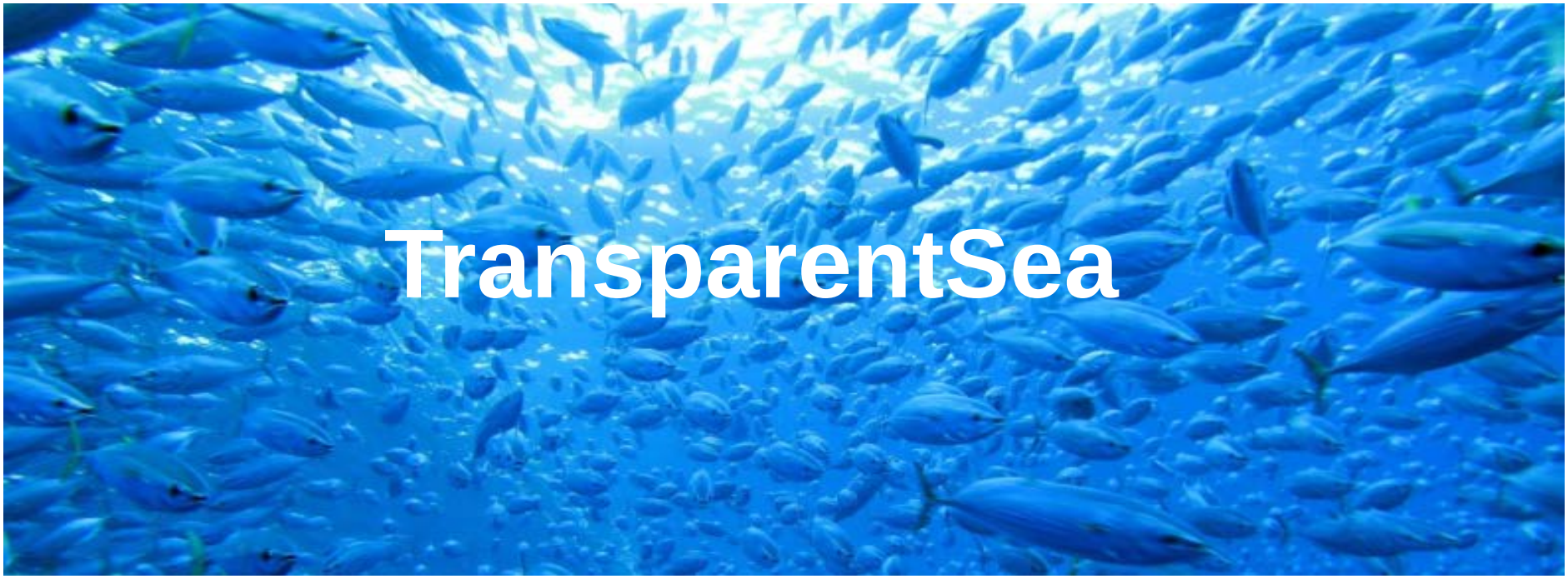
Outline

- LuxSpace activities related to IAP and SAT-AIS
- TransparentSea
- Real Time Intelligent Cargo Monitoring
- E-Sail
- Summary



TransparentSea

Project Partners:

WWF
World Wide Fund For Nature

LUXSPACE
An OHB Company

navama®

Users:

CERTIFIED SUSTAINABLE SEAFOOD MSC www.msc.org

ISSF INTERNATIONAL SEAFOOD SUSTAINABILITY FOUNDATION

TransparentSea

- **Focus:**
  - Exploitation of space based technologies for the assessment of fishing practice
  - Reinforcing the seafood eco-lables

- **Background:**
  - 80% or the world fish resources overexploited, in the state of collapse or depleted (FAO)
  - Regional and global initiatives to promote sustainable fishing practice
  - Growing awareness among sea food customers related t the thread and rising demand for **certified sea food products**

TransparentSea (Demonstration Project)

- **Challenge for certificated sea food**
  - Trust, credibility and transparency, through:
    - Clear standards and rules, defining sustainable fishing
    - Measures to monitoring and control fisheries activities
    - Publication
  - How to monitor to compliance of fishing activities on high sea where control is difficult?

Space based technologies can be of real added value

TransparentSea (Demonstration Project)

- **TransparentSea solution:**
  - Seamless tracking of fishing vessels using AIS and SATCOM
  - Analysis of the fishing vessel tracks
  - Activity profiling supported by EO derived information (ocean color, sea state and wind information)
  - **Assessment of the compliance** with sustainable rules and standards, e.g.:
    - where, when, how long
    - protected areas respected
    - no transshipment or unloading of fish according to the rules
  - **Publication** of the results using Internet and smartphone App

TransparentSea (Demonstration project)

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- **Benefits**
  - **Sea food certification issuer/standard setter:**
    - Proof that certification criteria of the certified fishery are met
    - Sea food origin, fishing practice and compliance assessments are transparent to all
    - Credibility, trust, reputation
    - Better marketing opportunities
  - **Certified fishery:**
    - Competitive advantage
    - Access new market segments
    - Price premiums
  - **Customer:**
    - Confidence in the sea food product
  - **Marine resources**

arviem

megatel
An OHB Company

OHB TELEDATA

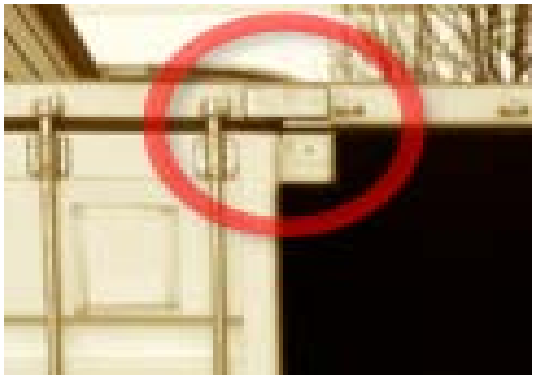
LUXSPACE
An OHB Company

SPACE SYSTEMS

Real Time Intelligent Container Monitoring

Background:

- **Arviem, OHB Teledata, megatel have developed and are offering an independent container monitoring service.**
- **Key features of the device are:**
  - GPS chipset for **localisation**,
  - Sensor suite, integrated in the device which monitors the container **conditions** such as
    - door security,
    - temperature and
    - humidity,
  - GSM/GPRS **communication** unit, and
  - Flexible to be (un)mounted,



User needs and challenges

- RTICM user: Exporter/shipper of high value goods, time sensitive, hazardous or perishable cargo
- According to own estimates from arviem and other sources about:
  - 30% of all shipments are either damaged or delayed
  - 15% of companies‘ logistics cost are inventory cost – safety stock
  - 30% of all perishable goods never reach the end destination
  - 1 in 5 cargo claims is due to moisture
  - Considerable financial loss
- Demand: monitoring tool which delivers timely, reliable and accurate information about the location, the status/conditions of the cargo
- Clients are unwilling to procure a full container monitoring solution, instead, clients are inclined to acquire the solution capability on a service basis.

Objectives

1. To extent the functionality of the tracking device:

- Wireless internal senor network
  - Shock
  - Movement
  - Light
- IRIDIUM satellite communication
  - allow ubiquitous bidirectional data transmission
- Software update over the air
  - Increase the device usage
- Linking of satellite based AIS data
  - bridge the gap if the container is stuffed inside the vessels hull and outside the reach of any communication mean.
  - Tracking of the container ships route and notification of any deviation, delay

Objectives (cont.)

2. To extent the service offering, including:

- **Analytics Component:**

  Analysis of sensor data in combination with other data sources and the provision of actionable information (e.g. intrusion, deviation of transport route or condition).

  The goal is to correct negative trends before they become costly problems

- **Operations Component:**

  Provision of a reliable service (e.g. availability of the device, simple usage, 24/7 availability)

Key Benefits for high value cargo shippers

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- **Full visibility** along the entire supply chain (even if multimodal)
- **Independent** tracking information
- **Inventory management,** since shipping status is known at any time and time of arrival can be updated.
- **Product quality,** since transport conditions are monitored and, if deviating from nominal status, immediate actions can be taken.
- **Customer Service** improvements, since customer can be informed in due time about any delay or possible degradation of the cargo and corrective measures can be taken immediately.
- **Security,** since any opening of the container doors is recorded and a notification to the shipper is sent immediately. Potential intrusion can be detected and located in time.
- **Compliance**, since transport conditions (e.g. refrigerated cargo and the need to maintain the cold chain) are monitored and their compliance with transport regulations can be documented.
- **Reduced insurance premiums**, since the transport risk (e.g. loos, damage or delay) can be minimised.

Users of the RTICM service

Hellmann Worldwide Logistics GmbH & Co. KG is a logistics services company with its head office in Osnabrück, Germany. The company has around 300 offices located on five continents. Services offered include air freight, contract logistics, customs brokerage, eCommerce, road freight, sea freight and sea-air.

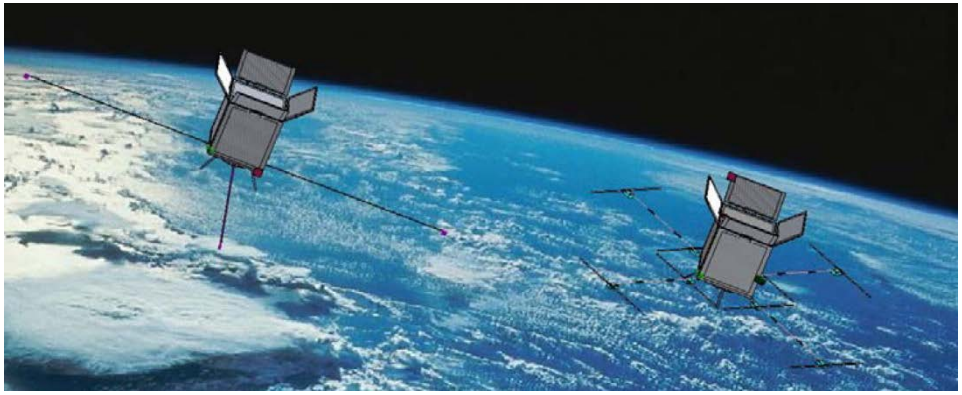
Husky Injection Molding Systems Ltd. is a supplier of machinery for injection molding of plastics. Husky now manufactures a wide range of injection molding machines, injection molds, hot runners, robots, and auxiliary systems used in plastics manufacturing.

Kuehne&Nagel has grown into one of the world's leading logistics providers. Today, the Kuehne + Nagel Group has more than 1000 offices in over 100 countries, with over 63,000 employees

Claas, is one of the world's leading manufacturers of agricultural engineering equipment (www.class-group.com), operates several production facilities with focus to serve global markets in time and according to customer needs. Constant, reliable and visible supply chain is a must for Claas.

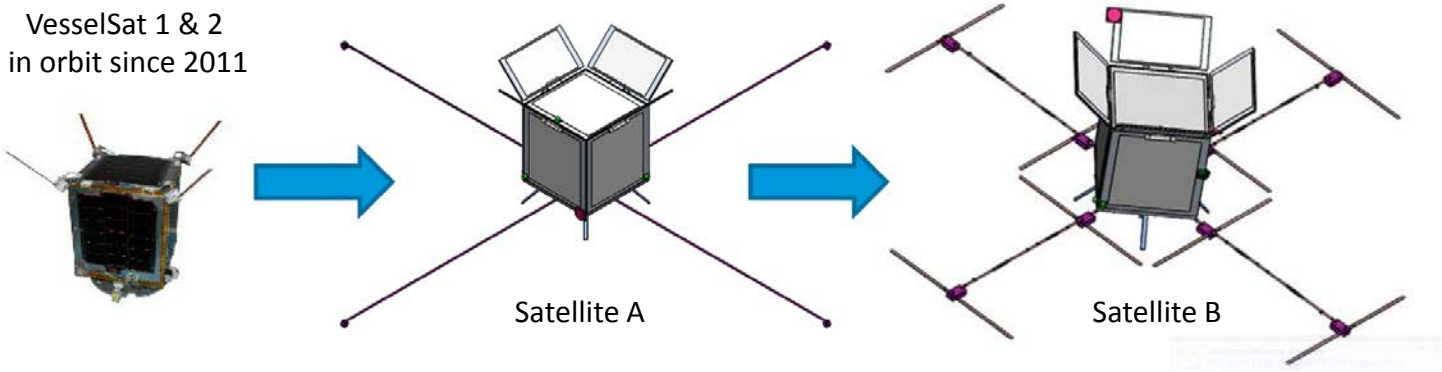
E-Sail

- **Objectives:** to developing a set of SAT-AIS Micro-Satellites (60-100 kg range) with higher power, larger size capabilities as well as advanced signal processing in-orbit
- **Rationale:** Microsatellites with the capability of supporting an AIS payload have been identified as the most cost-efficient approach to provide SAT-AIS services.
  - Gradual deployment of services with low initial investment
  - Higher number of satellites in orbit
- **Duration of the activity:** 2-4 years
- **Prime contractor :** LuxSpace Sarl
- **Customer:** exactEarth



E-Sail

- **Step-wise approach:** Incrementally improved microsatellites



The microsatellite activities under the SAT-AIS programme target the development of incrementally improved micro satellites:

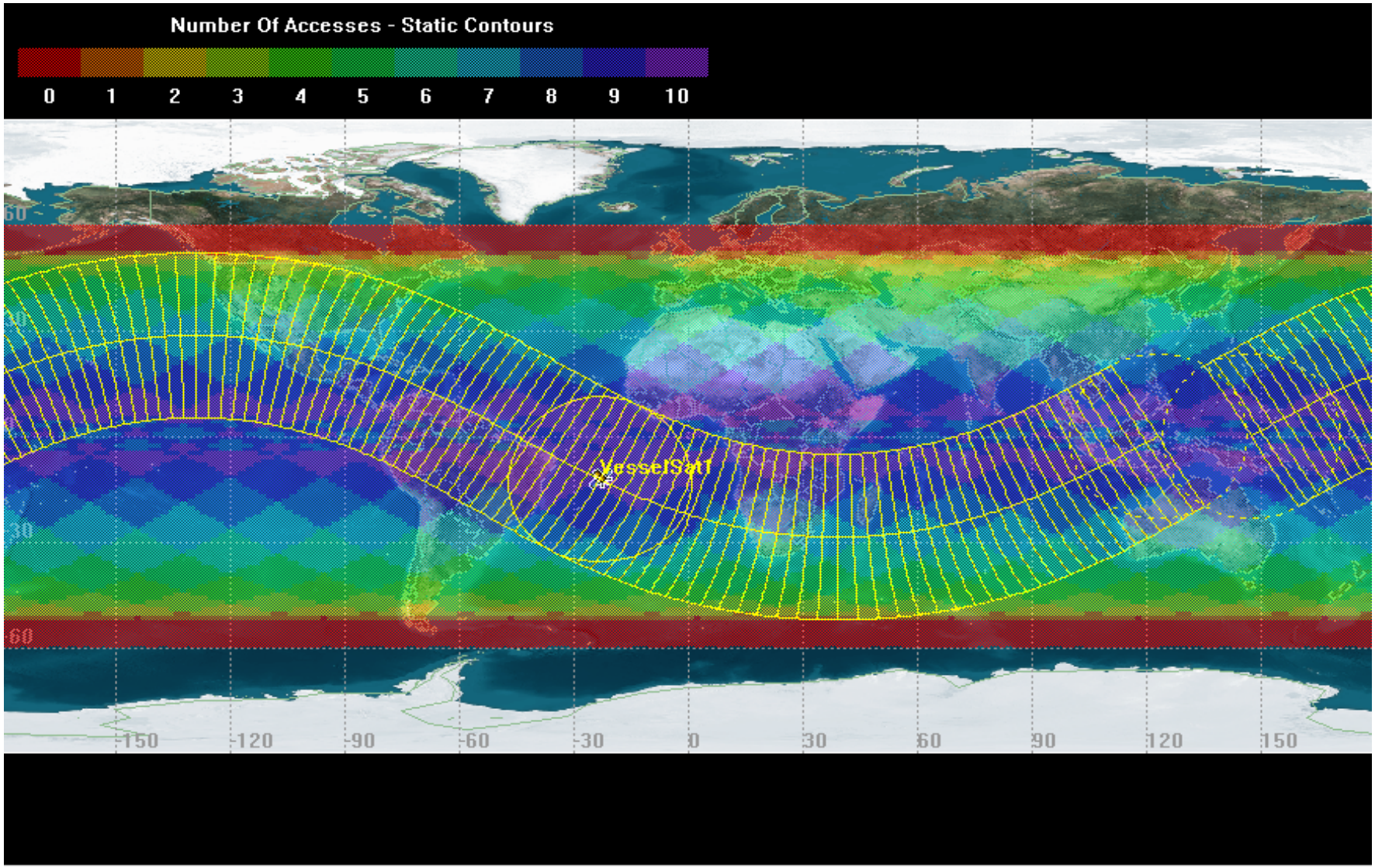
- advanced data handling & downlinks, improving ground processing capabilities, higher capable power, structure and Attitude and Orbit Control System (AOCS) subsystem meeting the needs of the upgraded payload
- Expanding the LuxSpace micro-satellite product range by making use of innovative technologies, competitive for the next generation of (SAT-AIS) constellations

Summary

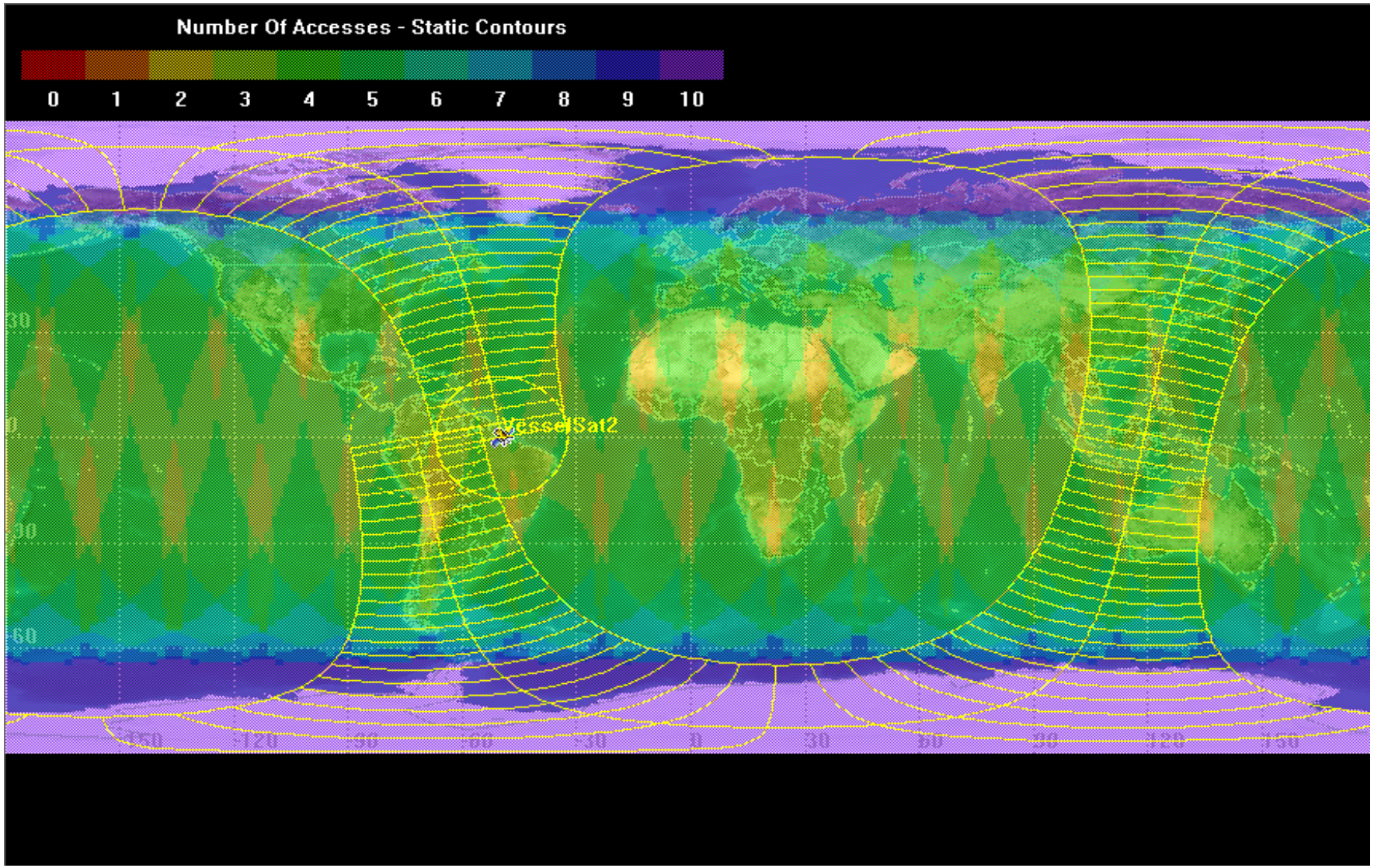
- LuxSpace made significant investments in creation of Sat-AIS data services and solutions for global maritime market (institutional and commercial customers).
- The active participation in the ESA ARTES 20 program (IAP) supports LuxSpace target to further develop and extent our SAT – AIS applications and service element.
  - TransparentSea
  - Real Time Intelligent Cargo Monitoring

Backup slides

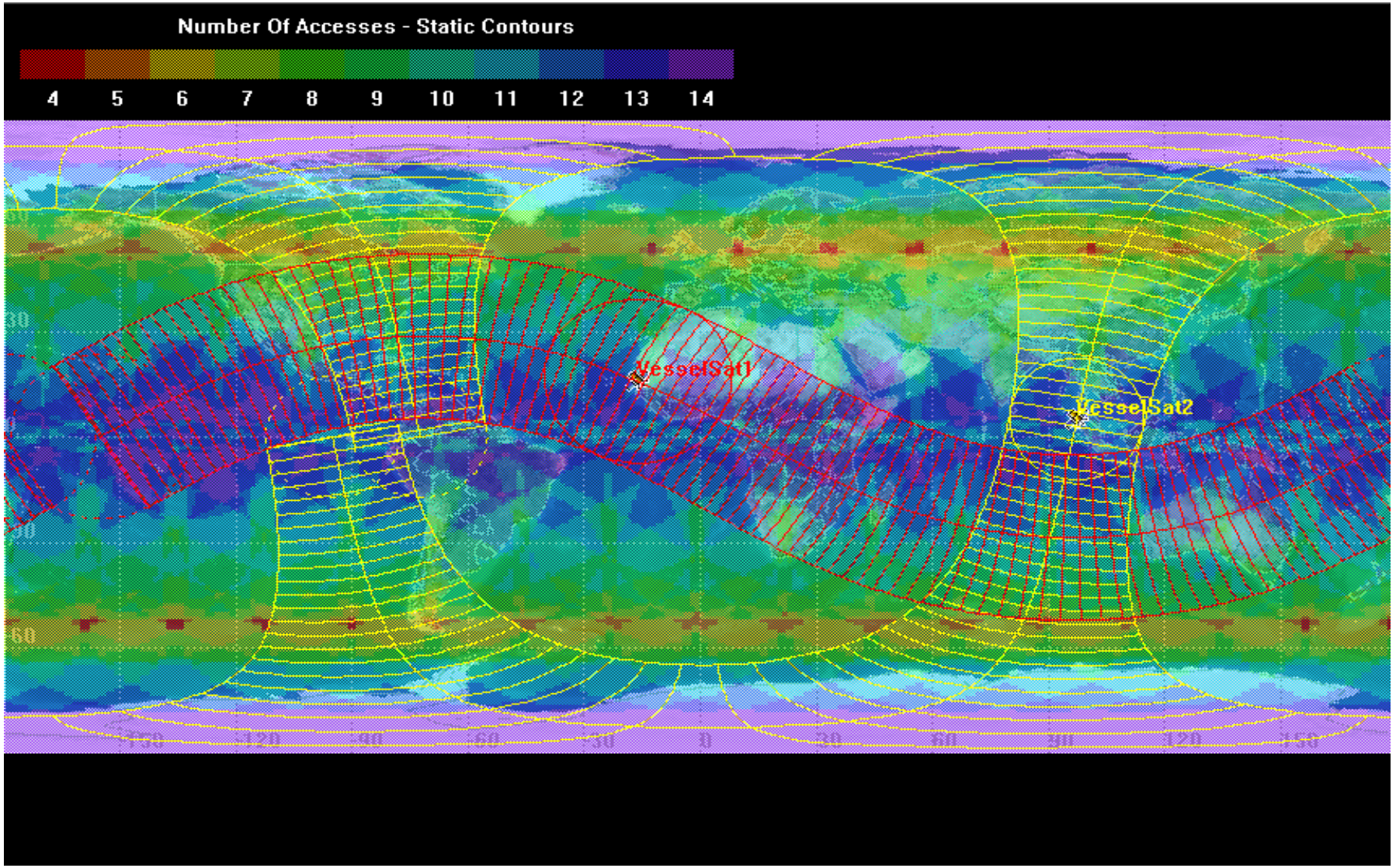
VesselSat1:
Equatorial Orbit Ground Track and Number of Accesses per Day



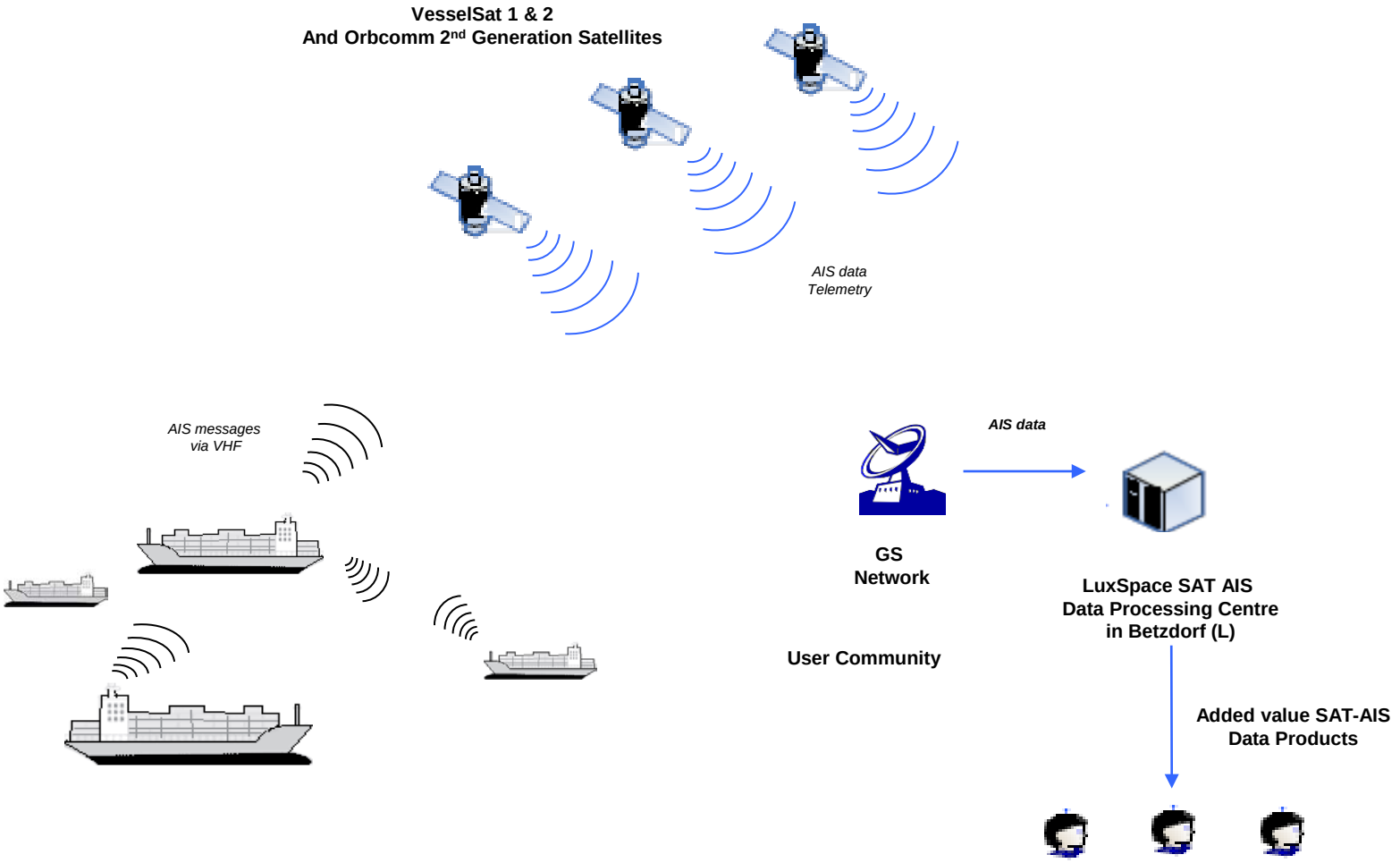
VesselSat2: Polar Orbit, Ground Track and Number of Accesses per day



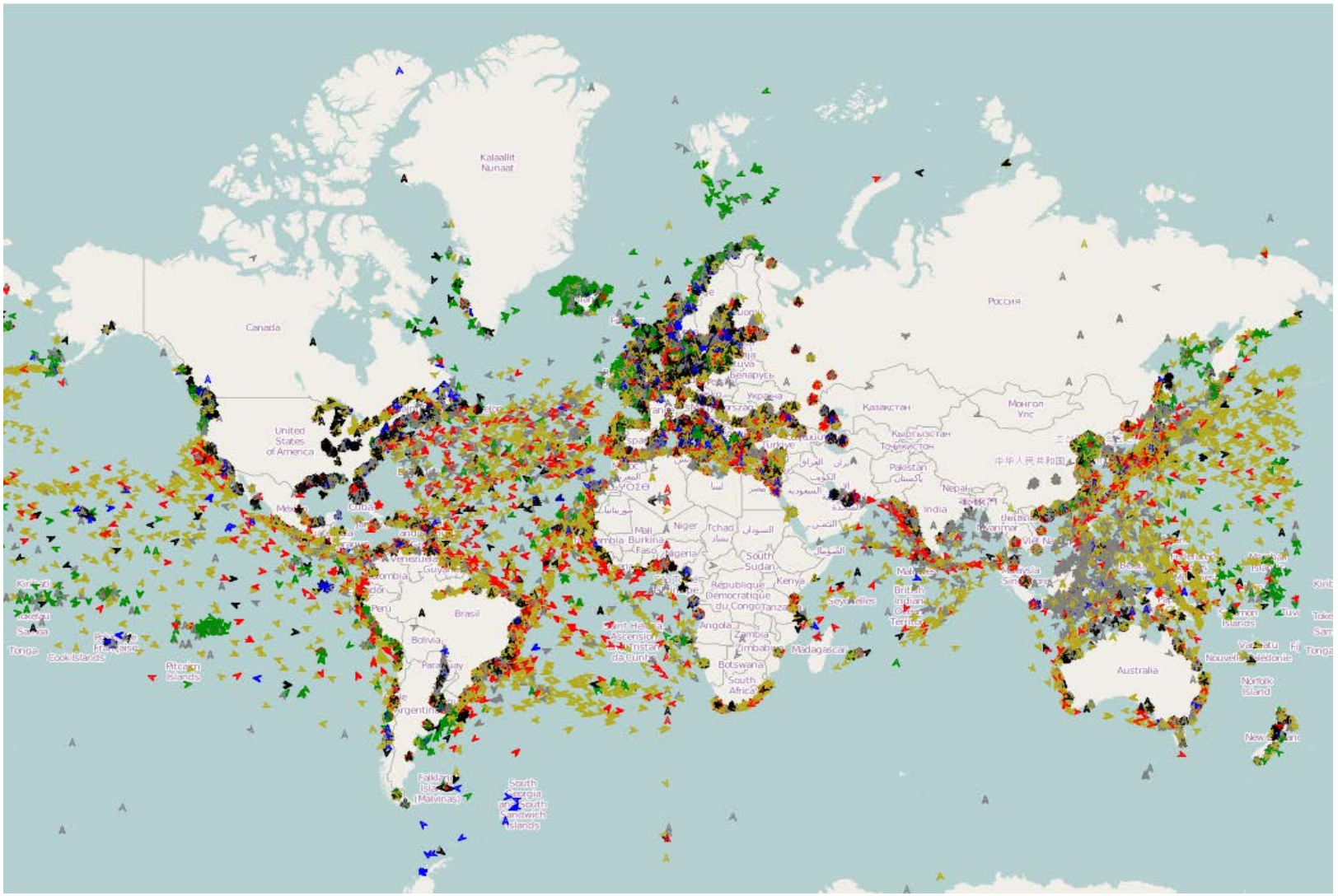
Vesselsat1 and Vesselsat2
Ground Track and Number of Accesses per Day



System & Service Architecture



Satellite AIS coverage

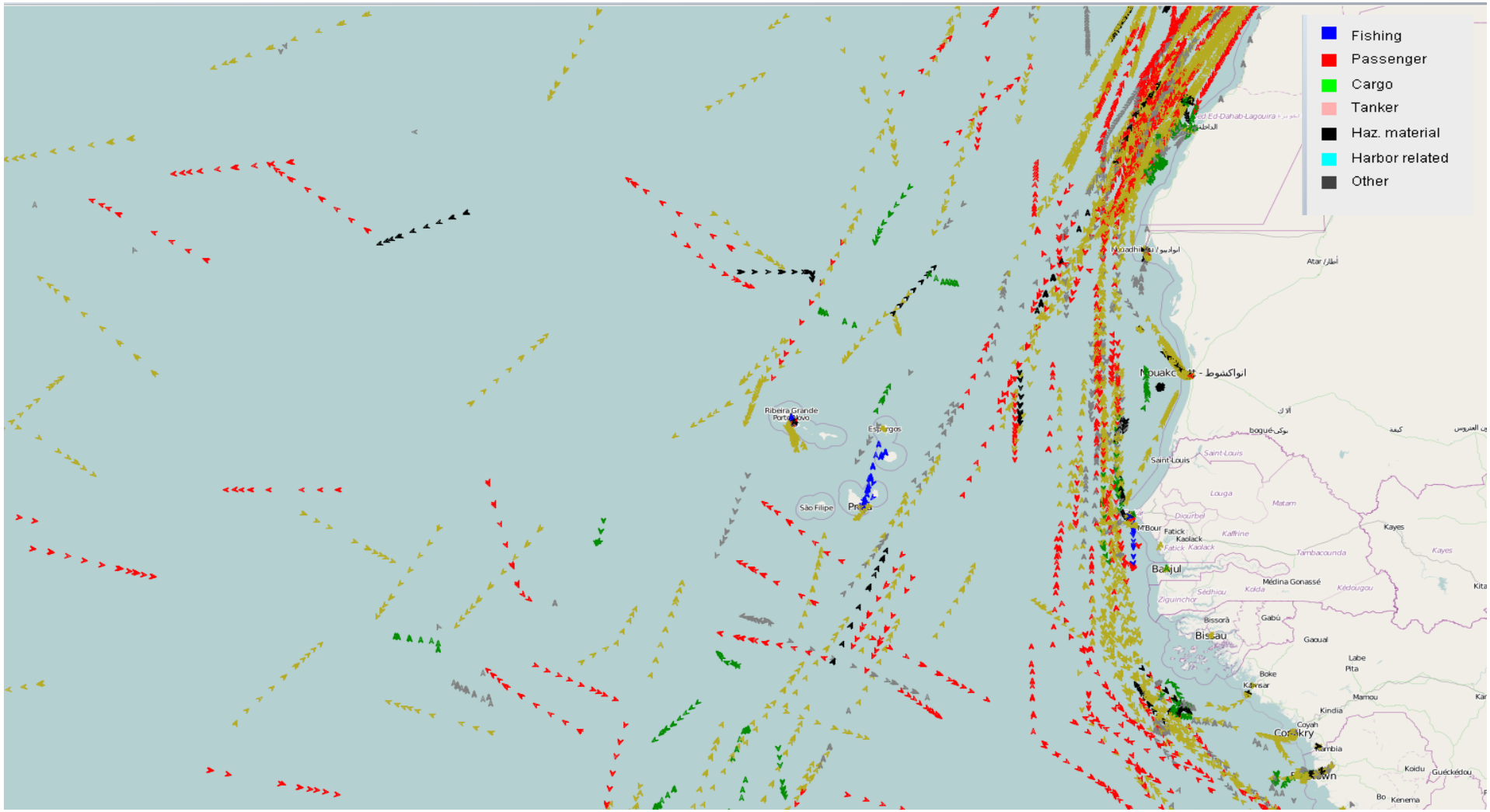


15.11.2013

61403 vessels displayed

350.000 positions

Global AIS coverage (terrestrial & SAT)



Sat – AIS: Benefits & Applications

Added value:

- Extended coverage beyond the coastline
- Global view
- Near real time
- More information about the ship compared to LRIT

Applications:

→ Maritime domain awareness,

→ Surveillance and security,

→ Search and Rescue,

→ Tracking and tracing ,

→ Energy and commodity management,

→ Fishery monitoring & control

→ Environmental monitoring