Space-based support to Maritime Surveillance

Harm Greidanus
European Commission
DG-Joint Research Centre

Maritime Surveillance

To govern our seas we need:

Maritime Situational Awareness

- **Which ships are on the sea?**
- **What are they doing?**
- **Do they pose a threat or problem?**

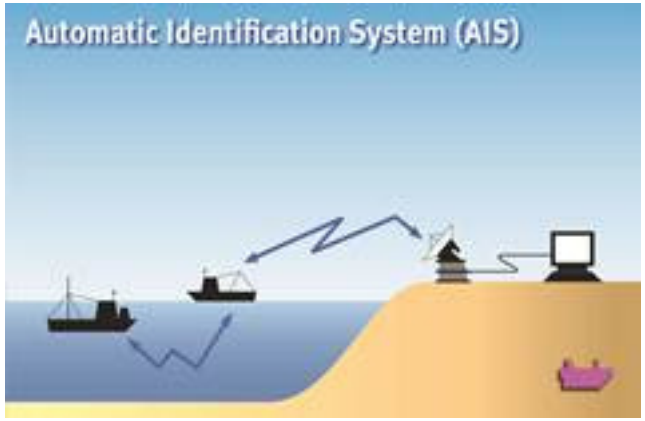
Tools for maritime surveillance

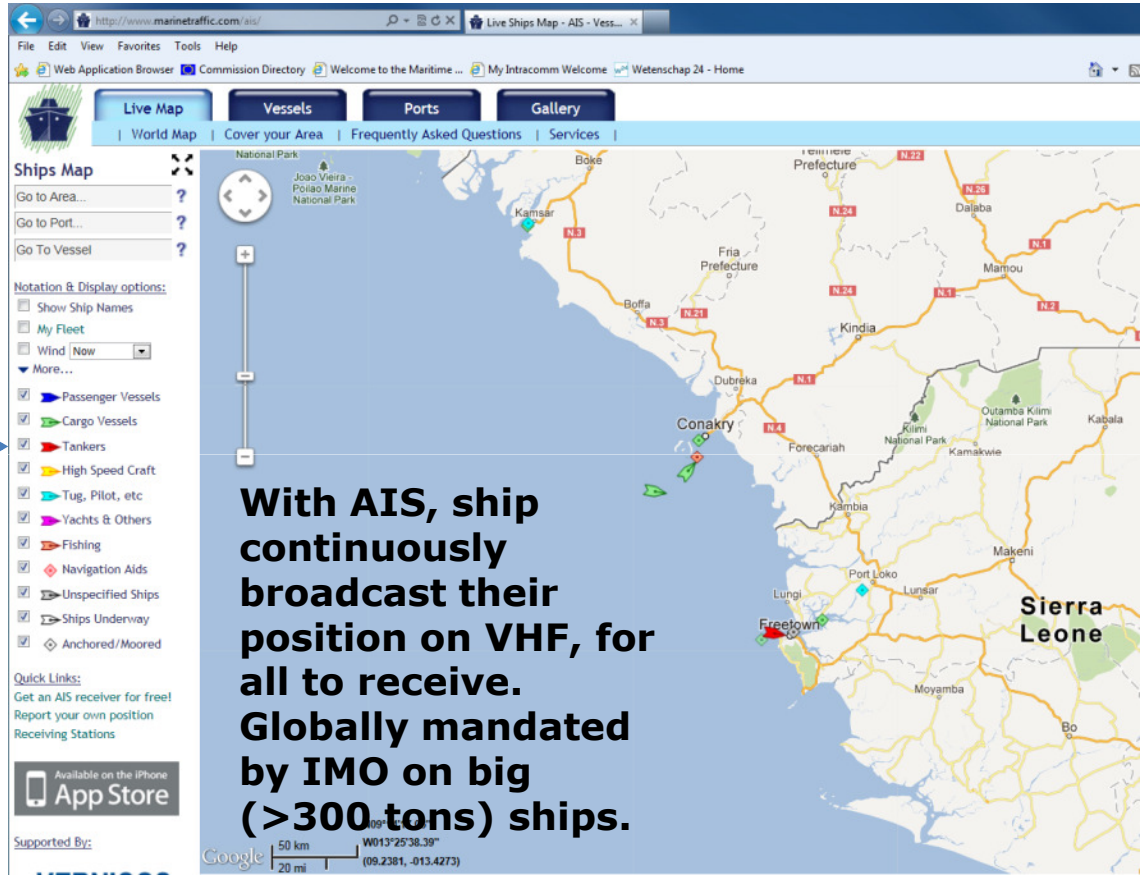
European Commission

1. From the coast

- **Visual**
- **Cameras**
- **Radar**
- **AIS messages from ships**

Out to some 30 km





Coastal AIS is inexpensive and easy to install and operate.

The MSSIS / SeaVision network enables sharing of the picture

Tools for maritime surveillance

European Commission

1. From the coast

- Looking out
- Cameras
- Radar
- AIS messages from ships

Out to some 30 km

2. Going to sea

- **Patrol boat**
- **Maritime Patrol Aircraft**

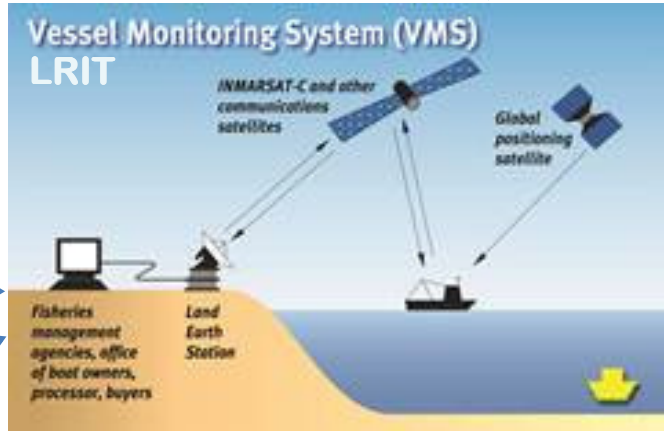
Expensive, but also allows intervention

Tools for maritime surveillance

European Commission

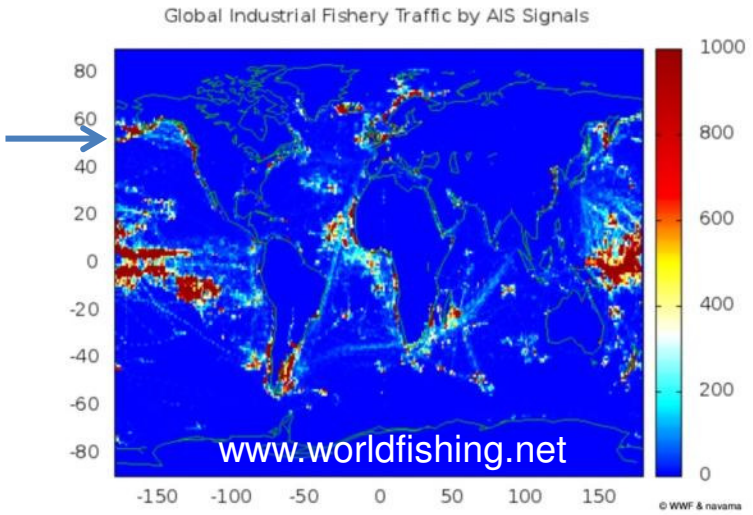
3. Ocean-wide

- **LRIT**
  - **Merchant ships** (>300 ton) report every 6 hours to their Flag State, globally mandated by IMO
- **VMS**
  - Medium – big **fishing ships** report every 2 hours to their Flag State, mandated at national level



- **AIS received by satellite**
  - From coastal to global coverage

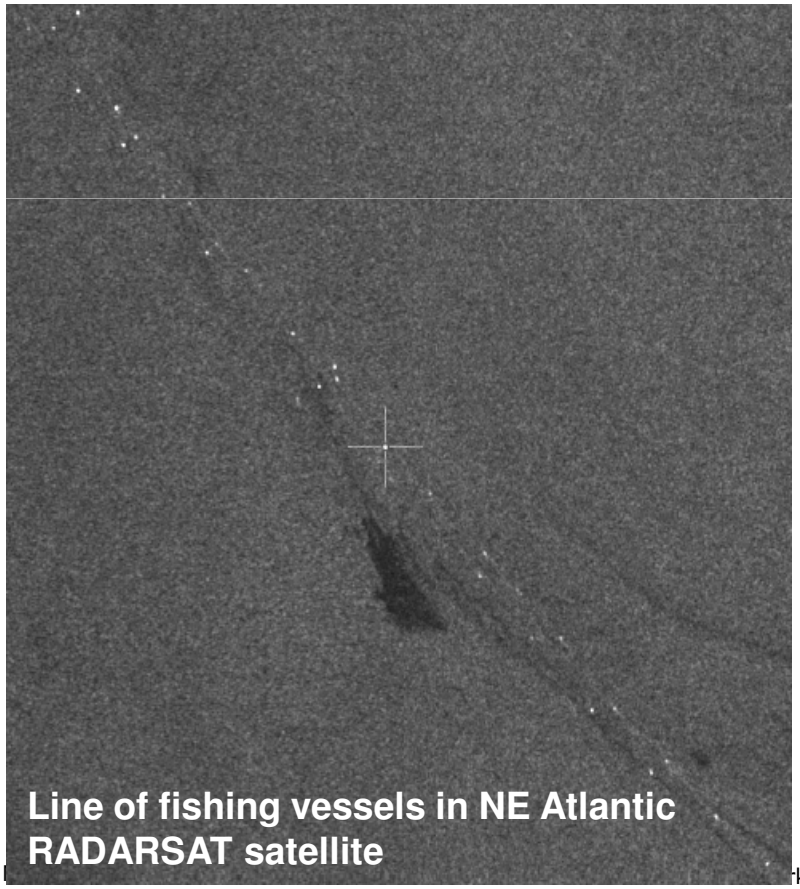
- **Earth observation from satellite**
  - To also find non-reporting ships



Satellite images: Optical or Radar

Radar satellite images
- Independent clouds, night
- Less details on targets

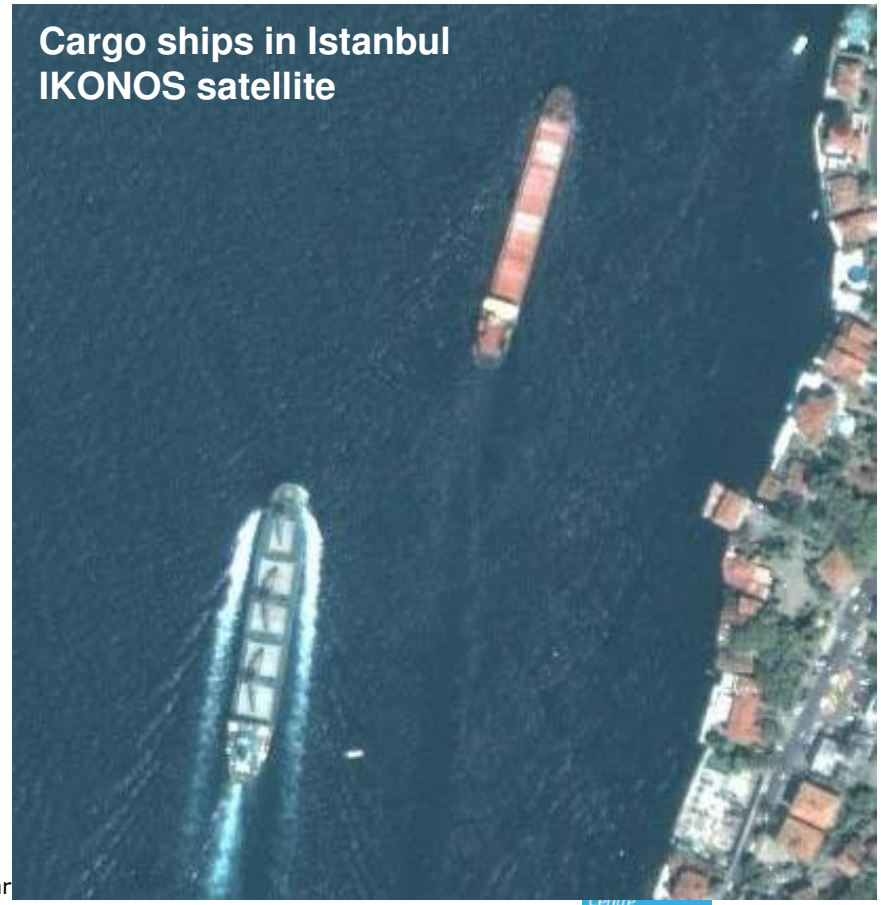
→ Preferred for **detection** and **wide area surveillance**



Line of fishing vessels in NE Atlantic
RADARSAT satellite

Optical satellite images
- Daytime, clear skies
- Easier to interpret

→ Preferred for **recognition** and **small focus area monitoring**

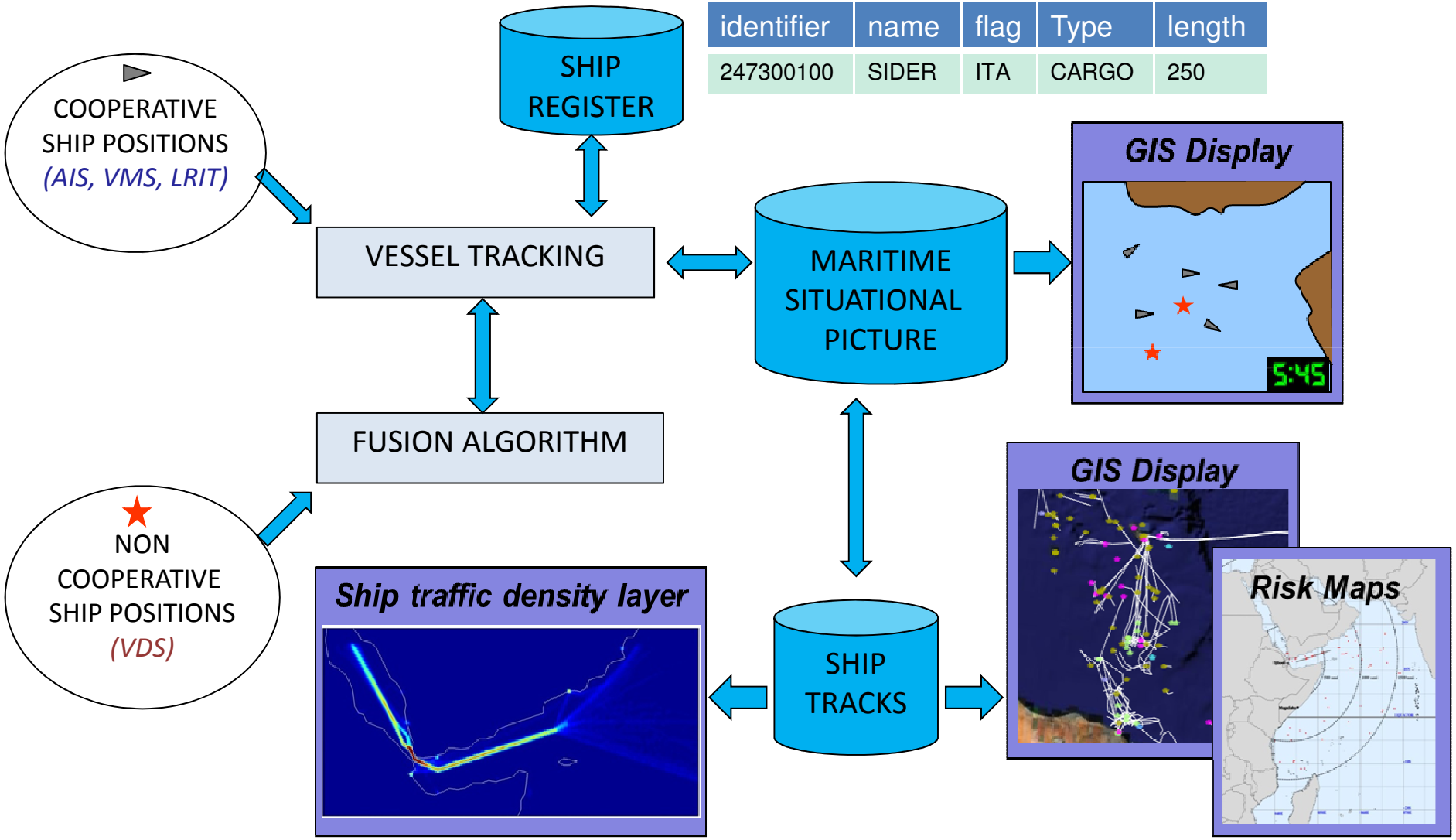


Cargo ships in Istanbul
IKONOS satellite

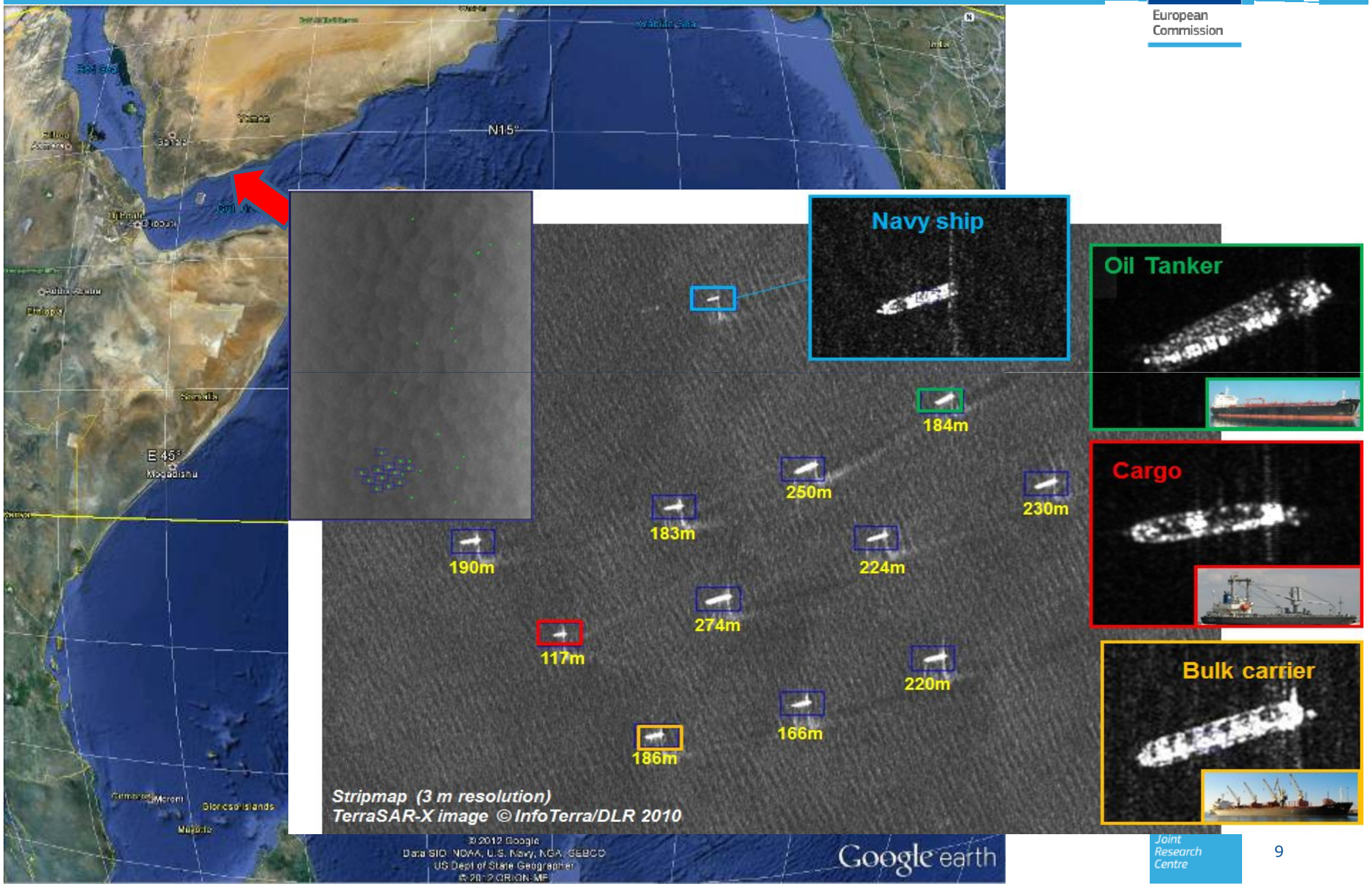
EU's PMAR project: Piracy, Maritime Awareness and Risks

- **Maritime awareness as capability for counter-piracy activities**
  - Integrating data from different sources
  - Using tools that can be used by maritime authorities in Africa
  - Part of "Regional Maritime Capacity Building"
- **Over Piracy-affected regions**
  - Gulf of Aden, Western Indian Ocean and Gulf of Guinea

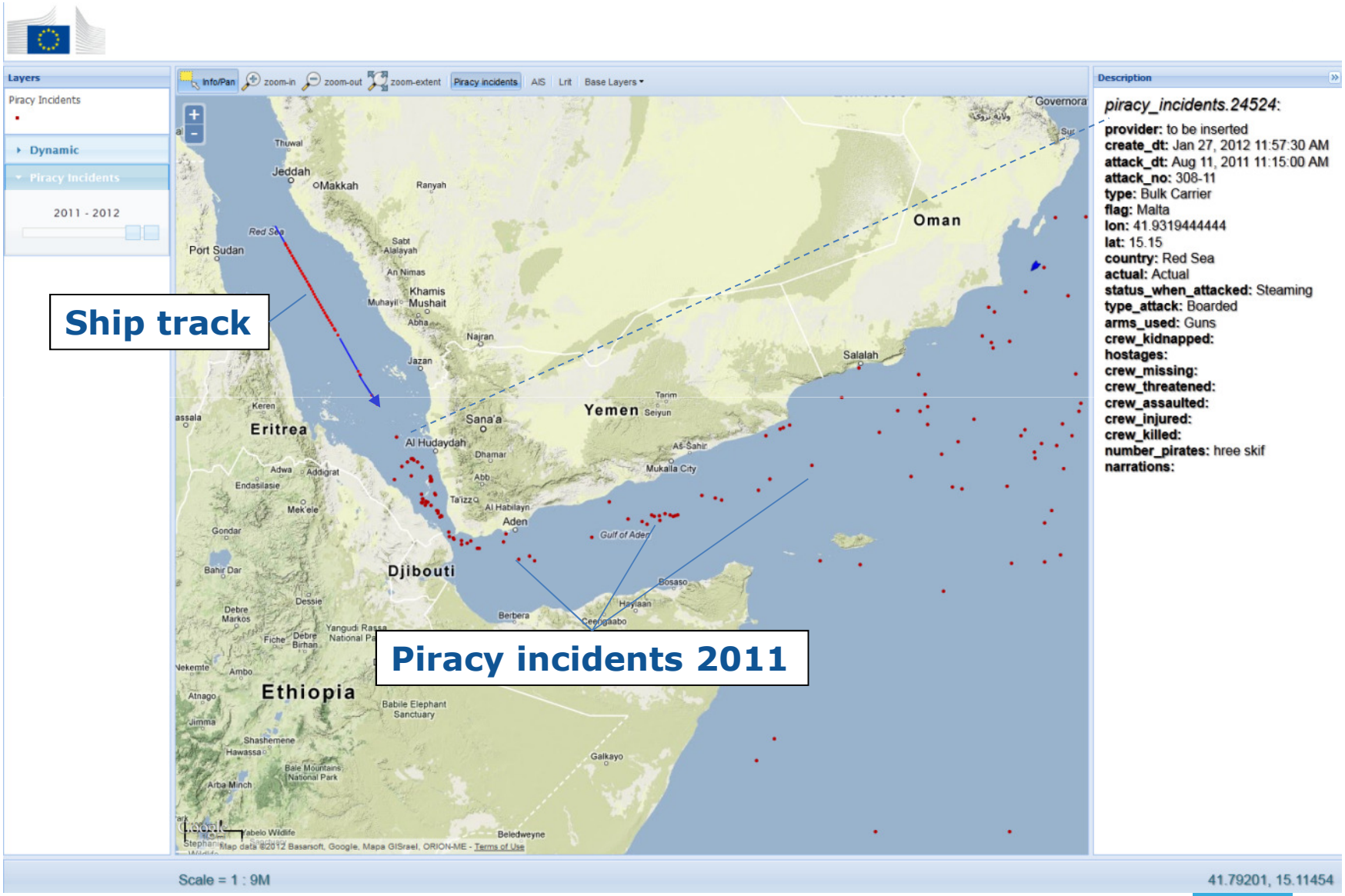
Building the Maritime Situational Picture



Ship surveillance from imaging satellites



Use for risk assessment



Conclusions

- **Continuous (partial) surveillance of coastal zone is possible with AIS**
  - Low-cost, easy to maintain **coastal AIS receivers**
- **Recent technology (LRIT, Satellite-AIS) enable Maritime Situational Awareness over wide areas**
- **The continuous picture from the reporting ships can be complemented with detections from satellite imagery, on an incidental basis**
- **Technology accessible to entities also in Africa**
- **Finding (+track/classify) *small* boats remains a challenge**

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THANK YOU

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