Smart ERS

The use of Geospatial and Earth Observation data in Maritime Emergency Response

Civil Servant Researcher Citizen



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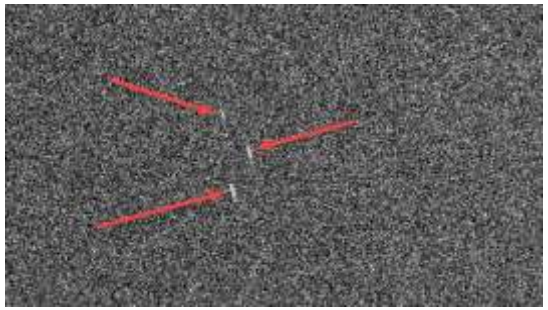
Libyan Case

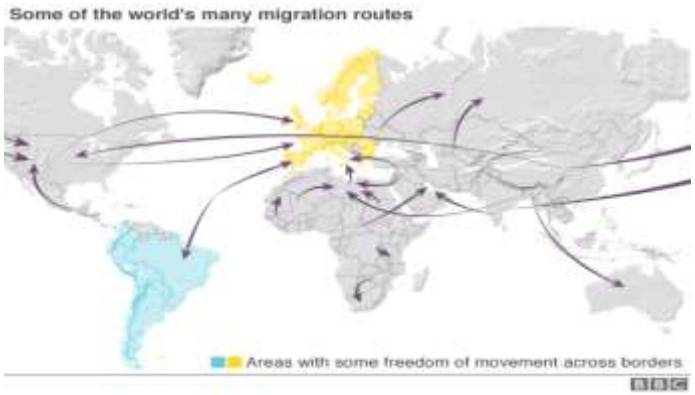


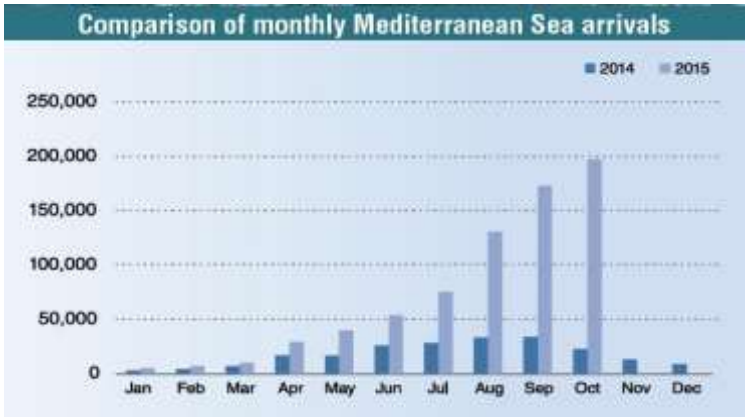
On Tuesday, 6 October 2015, more than 370 people, including nine children and four pregnant women, aboard three rubber boats were rescued off the Libyan coast and brought to the Italian shores.

The Frontex Situation Centre in cooperation with European Maritime Safety Agency spotted several small boats on a satellite image of an area close to the Libyan coast, where migrant boats in distress are often detected.

The information was passed on to the Italian authorities, who informed the flagship vessel Cavour which was present in the area, and the emergency was successfully handled, and none of the migrants died.

Introduction





Recent **social, environmental and natural emergencies** inquiry civil servants, researcher and citizen communities for attempting responses.

790,000 people had arrived in Europe by sea by Nov. 2015, **3,329** died.

Within this work we consider and analyse these mass movements in the context of the **EDM**

About EMSA

Background:

Post *Erika* (2002: EMSA established, set-up started 2003)

Legal basis: Regulation 1406/2002/EC

Regulatory Agency of the European Community

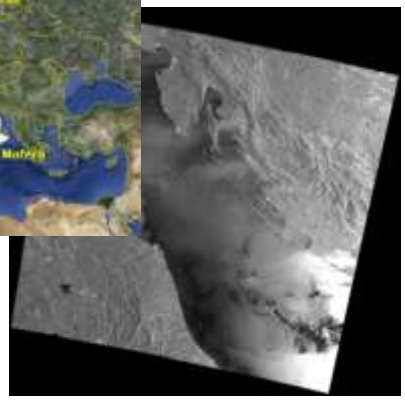
Own legal identity

Technical and operational support to EC and MS

Approximate 200 staff

Annual budget about 60 MEURO

Earth Observation Data Centre



Planning

Acquisition and Processing

(radar and optical)

Features Analysis

Analysis Results

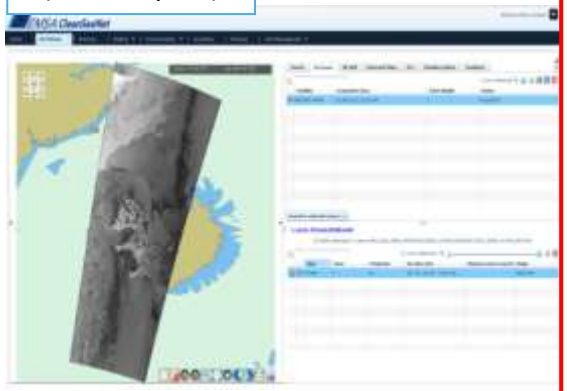
(EO derived information)

Phone and email alert

(Alert Report)

Data dissemination through Standard Web Services

ancillary data



Product Processing and Alert Generation

CSN

Border Surveillance

Fishing Monitoring

Copernicus Services

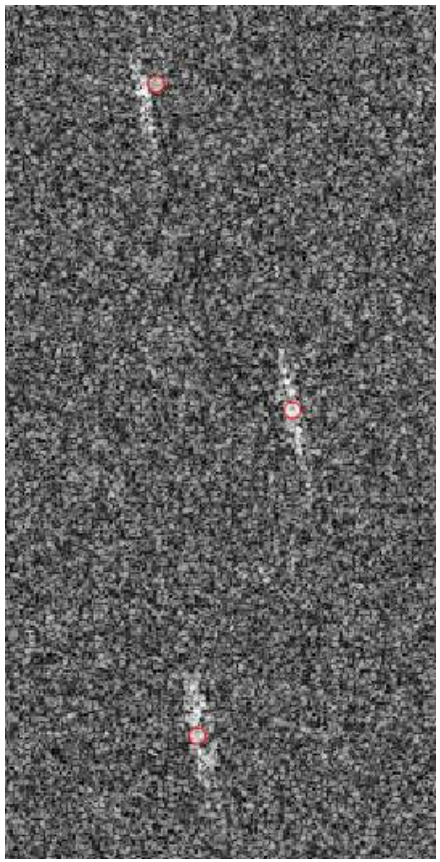
Earth Observation Service Providers

EMSA EO Data Centre

T0 = End of scene acquisition

T = T0 + 30 min

Search and Rescue detection



"Target definition".

1. People smugglers tend to use old and relatively small vessels.
2. Correlating AIS (maritime traffic) against VDS (SUMO).

"Pattern analysis"

1. In this paper we have assumed that people smugglers tend to perform their activities in fleet (from 2 to 4 vessels at the time). They tend to use a specific route.

STEP:

1. process the radar image with the SUMO algorithm to extract a set of VDS;
2. correlate the VDS with AIS to filter out non-compliance cases;
3. cluster non-compliance VDS that have a Euclidean distance between them of less than 1 nautical mile;
4. select clusters that have more than 2 VDSs sharing the same heading and the size between 4 to 12 meter;
5. create a georeferenced ring that includes the clustered VDS;

Emergency Disaster Management

Search and Rescue emergency (IMO convention):

- Time: it is of paramount importance to detect the emergency as soon as possible;

- Observational capacity: there is a need to maximise the monitoring capabilities of an emergency in order to improve the quality of the rescue activity.

Through **Earth Observation** data, **Emergency Response Systems** (ERS) should provide the capability to integrate information from diverse sources: satellite, UVA, in-situ, VGI.

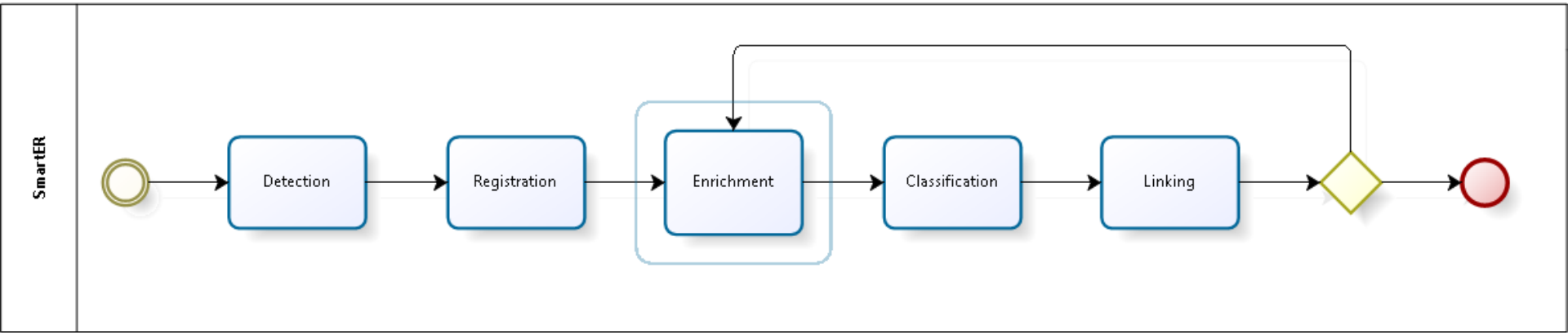
E**xperts cannot process exhaustively the amount of information** published on the EO systems in real time during and emergency.

Semantic web for emergency SmartER

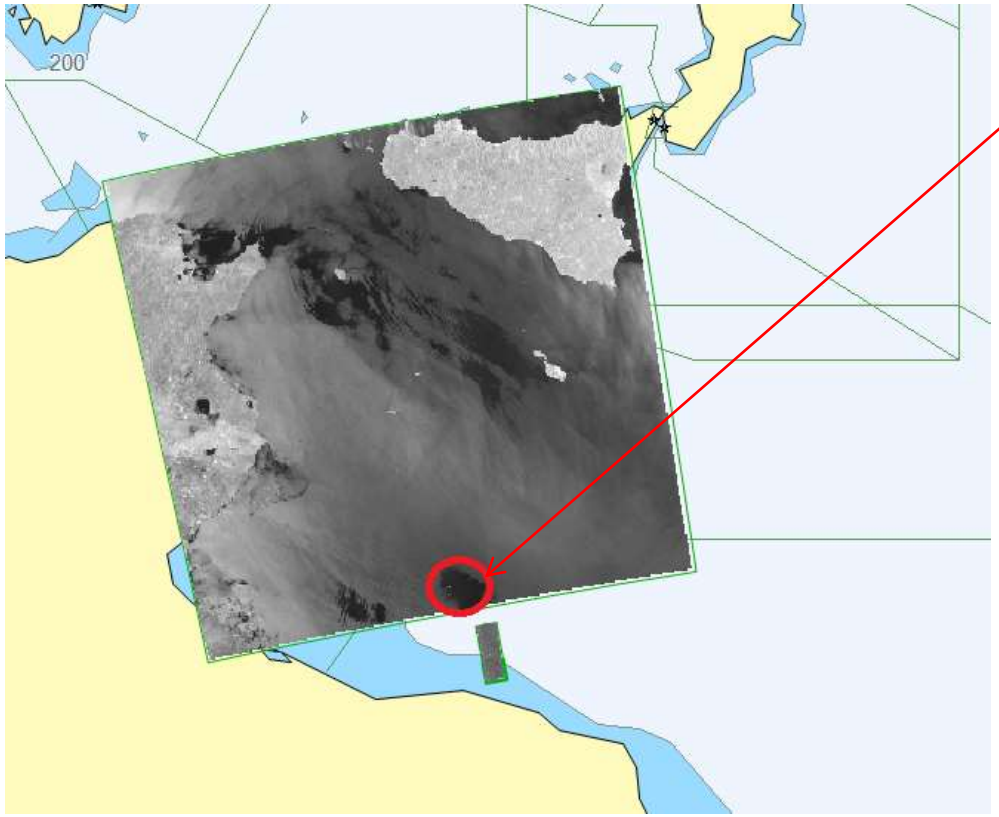
1) **Ontologies** helps to solve issues such as: the integration of information from mixed sources, the dissolution of ambiguities in terminology, the improvement of information retrieval, the identification of relevant information with respect to a given domain and data features (resolutions, quality, etc.);

2) the **Resource Description Framework** language (RDF) extends the linking structure of the web through semantic mark-ups, which are machine-readable-understandable annotations associated with web resources;

3) **Uniform Resource Identifier** (URI) provides the means to unambiguously identify web resources.



SmartER and Libyan case



http://.../sar/2015-10-06-smfx9yv13pev

Conclusion

I personally strongly believe that only when different sources of data will be free to be used and easy to access (**Open Data**), emergency services can improve their capacities and capabilities to detect emergencies and monitor their evolution. Only at that time such mass movement of people can find possible technical solutions by public organisations, researchers or industry.

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