OPTIMARE

Airborne Oil Spill Monitoring

Dr. Nils Robbe,
OPTIMARE Sensorsysteme GmbH & Co. KG

Presented at the Interspill 2012 Spill Industry Seminar, London, UK, March 13th, 2012

The company

- 1991: Foundation of Optimare GmbH
- 2002: Foundation of Optimare Sensorsysteme AG
- ISO 9001
- Approved as a supplier of aircraft systems and equipment for the German Armed Forces
- 2010 to 2012: Major restructuring

EN ISO
9001:2000
DNV
Certified
Company


FEDERAL REPUBLIC OF GERMANY
FEDERAL OFFICE OF DEFENSE TECHNOLOGY AND PROCUREMENT (BWB)

Certificate of Approval
as a Contractor for Bundeswehr Aircraft Systems and Equipment

OPTIMARE: References

- Airborne remote sensing of oil spills: sensors and mission management
- Maritime surveillance aircraft as airborne remote sensing platforms
- More than 40 reference installations worldwide

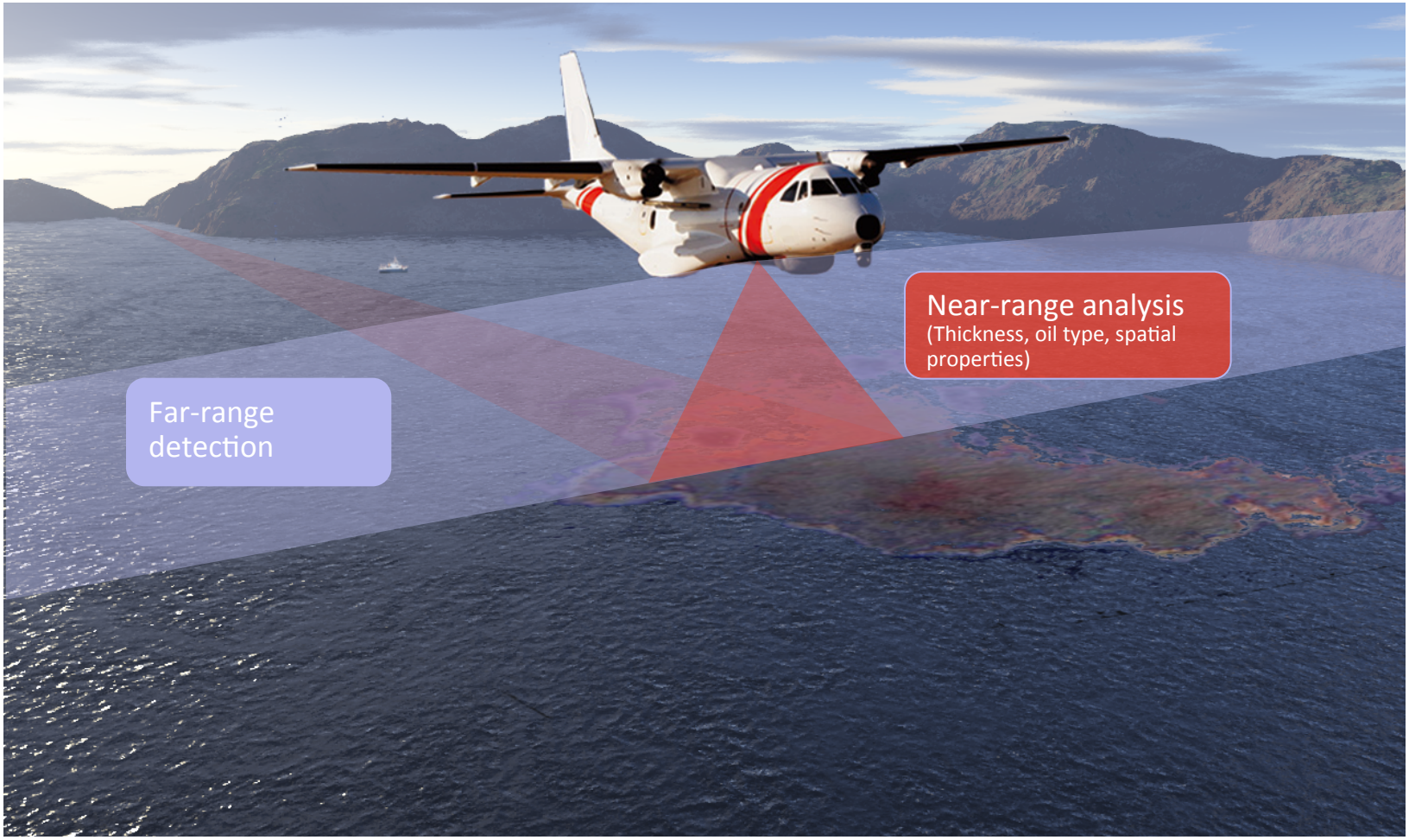






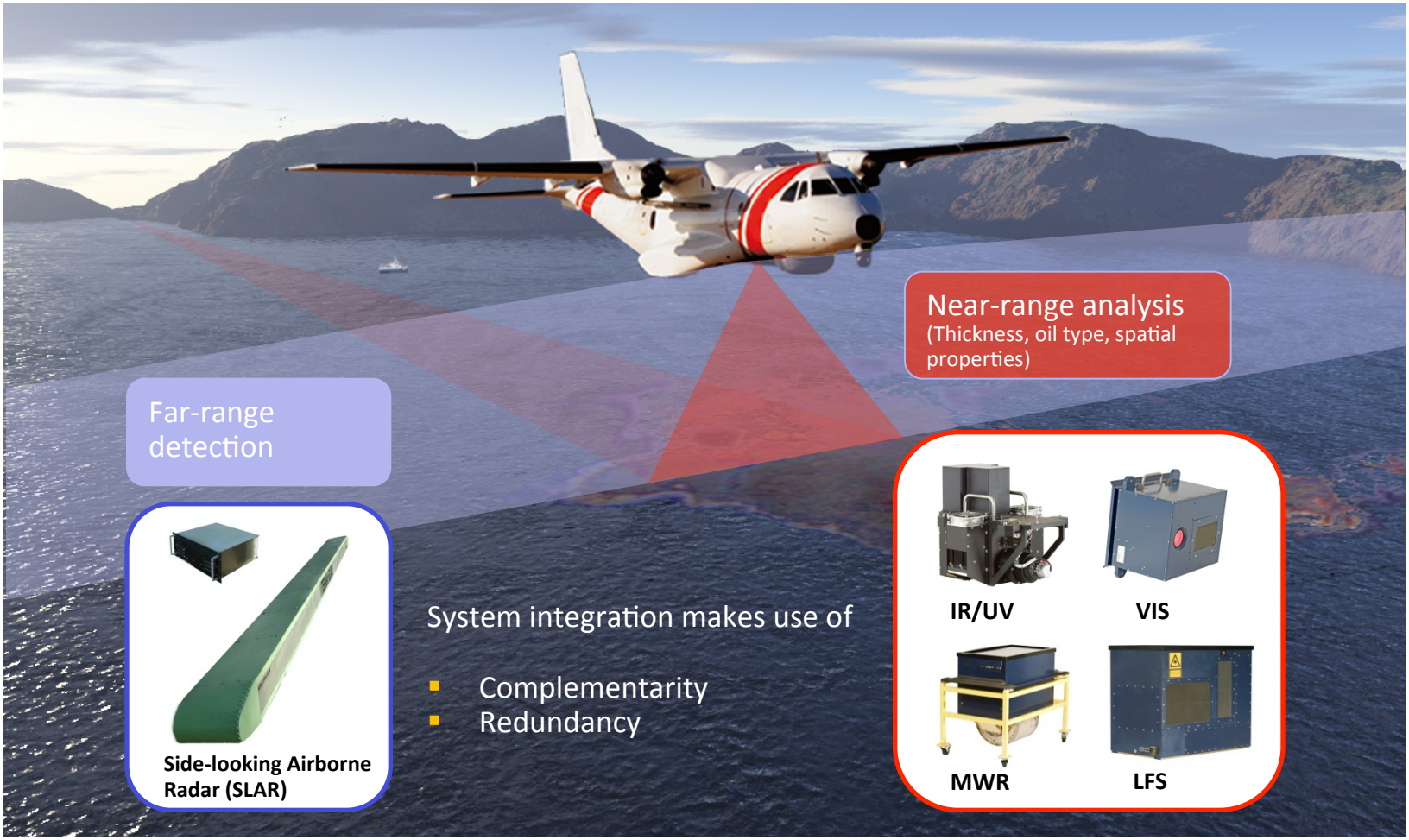

Airborne oil spill monitoring

Two principal modes of operation



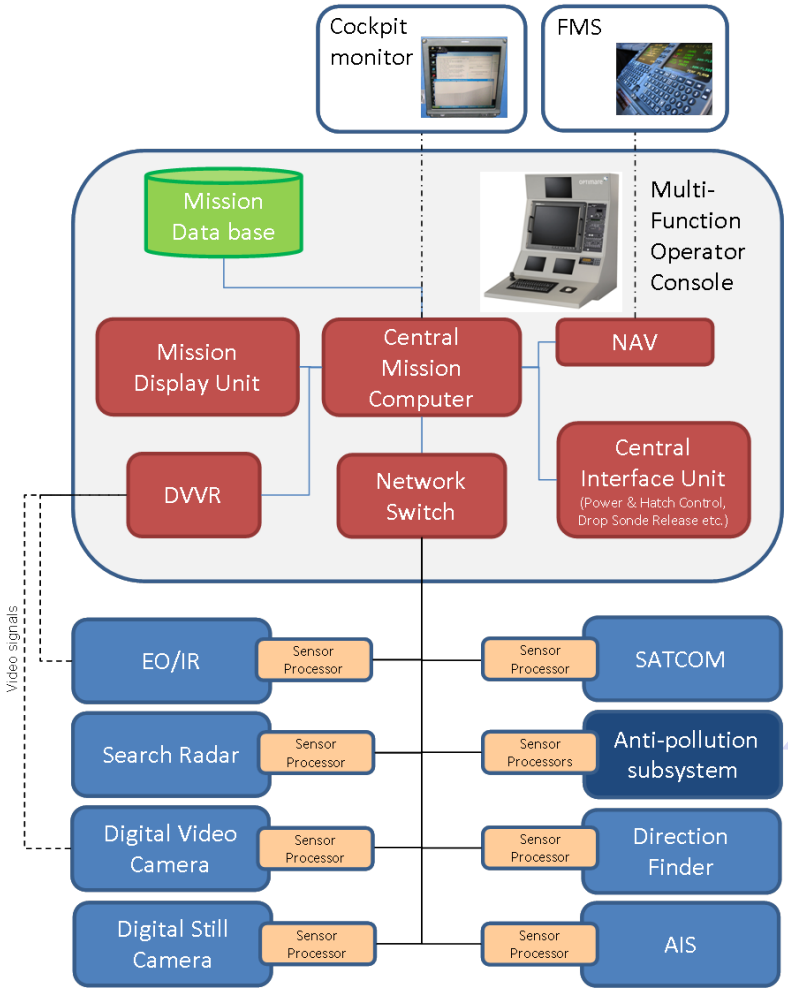
Airborne oil spill monitoring

Two principal modes of operation



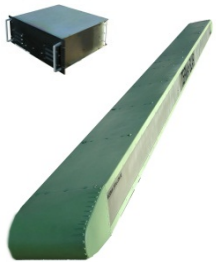
MEDUSA: An integrated approach

MEDUSA Maritime Surveillance System



System integration makes use of
- Complementarity
- Redundancy

MEDUSA can be used
- stand-alone
- as a subsystem

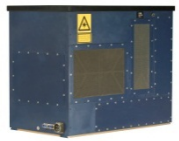


Side-looking Airborne Radar (SLAR)

IR/UV

VIS

MWR



LFS

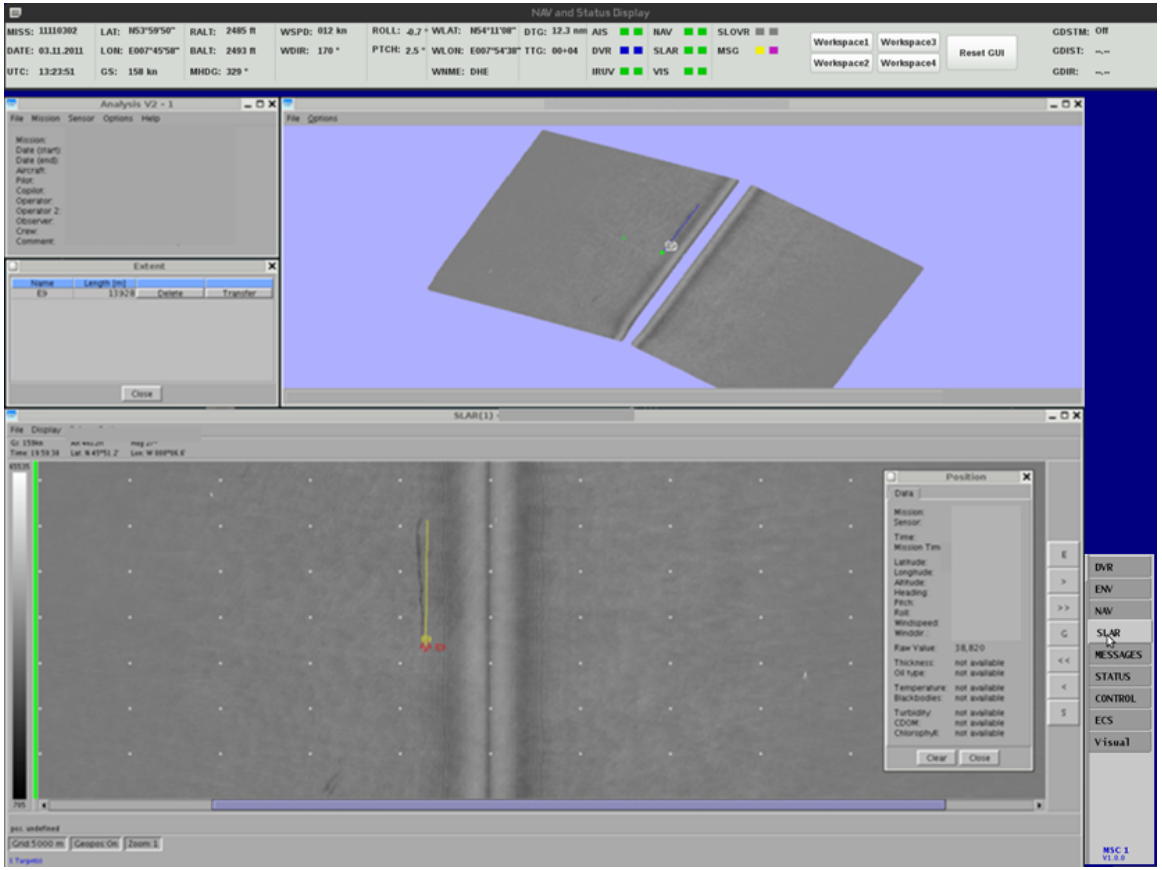
Oil spill detection by SLAR

Side-Looking
Airborne Radar (SLAR)

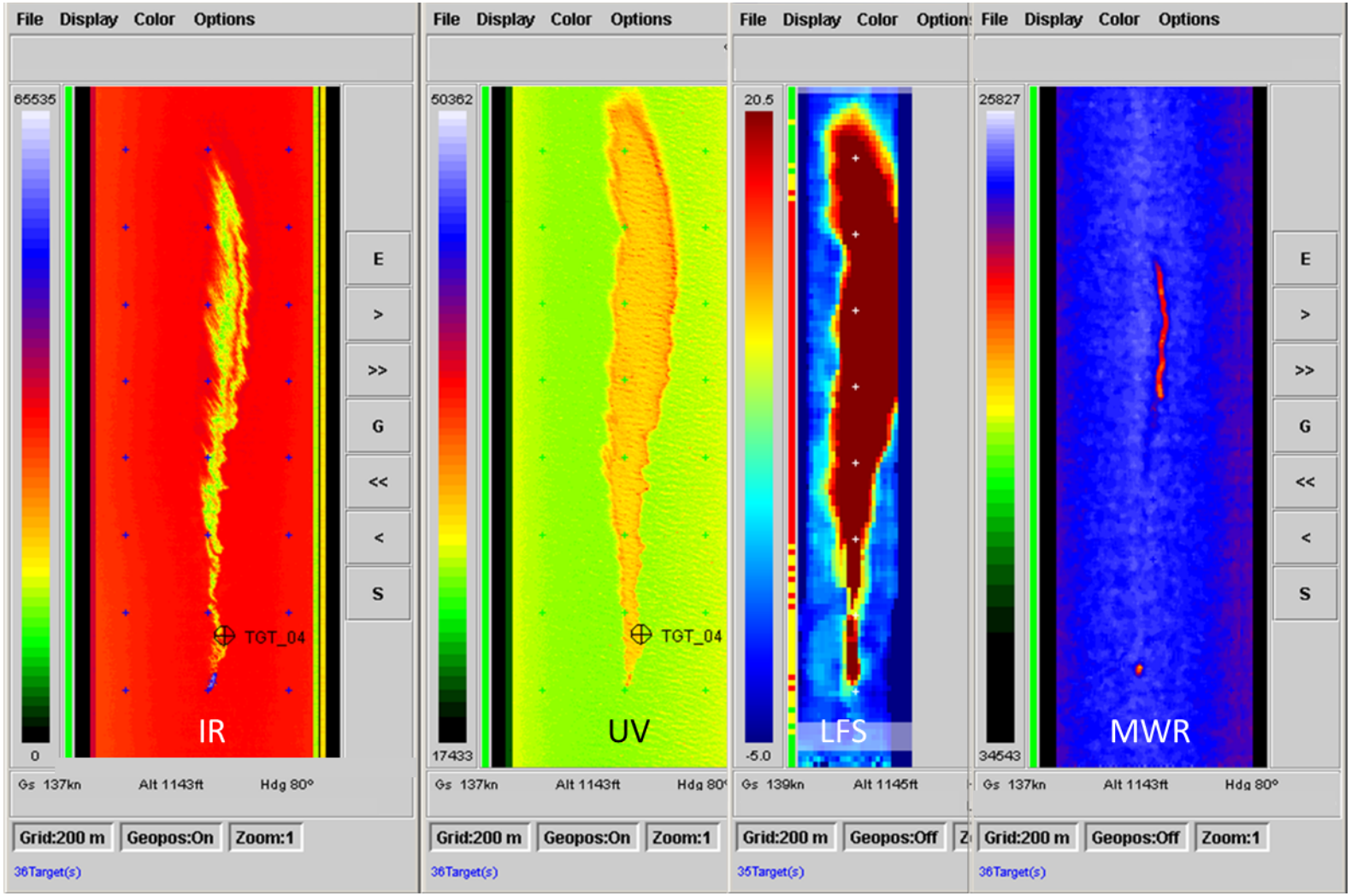
- X-band type (~ 9.3 GHz)
- Real-aperture type

Oil spill detection by SLAR

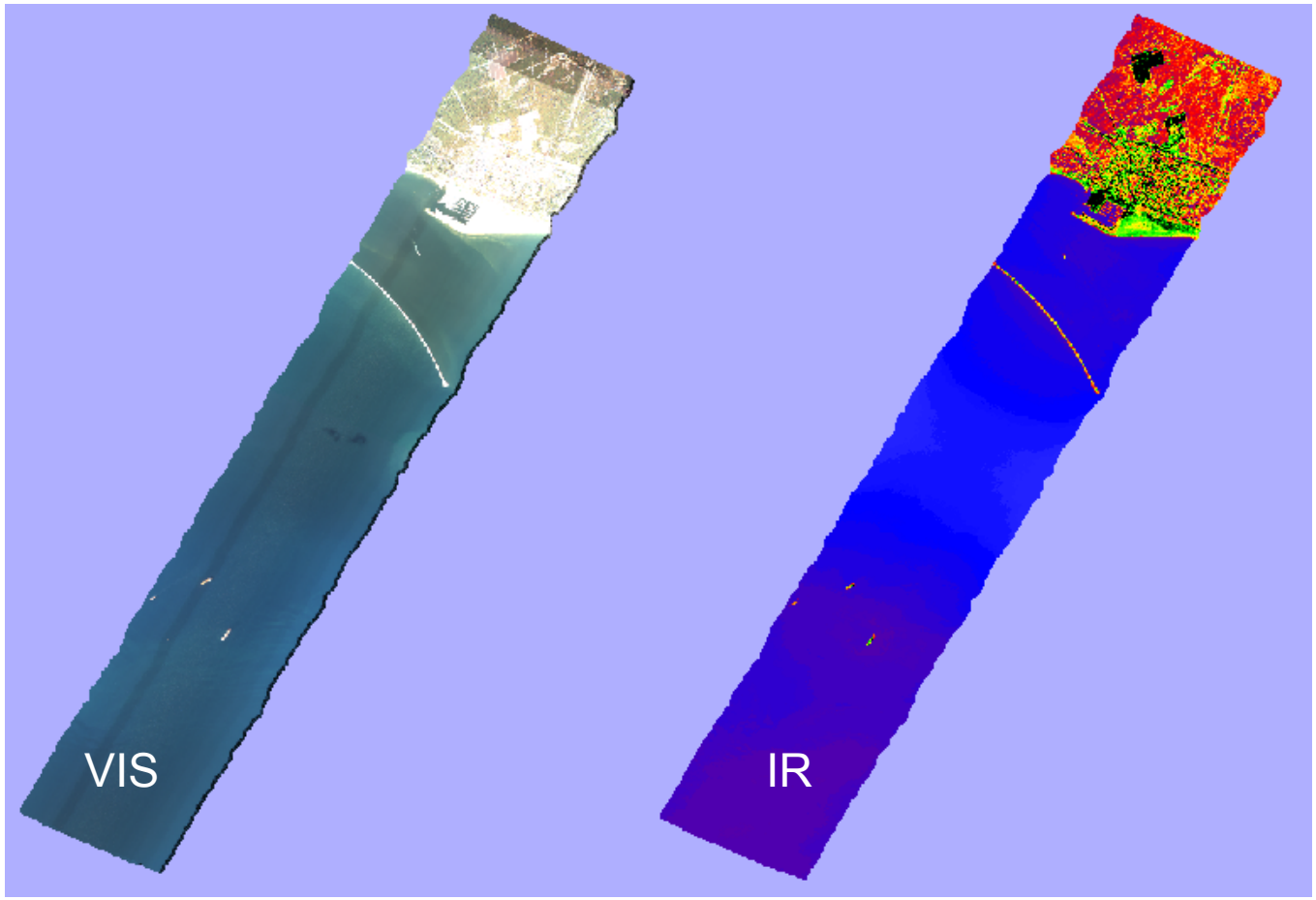
SLAR functionality of the MEDUSA System



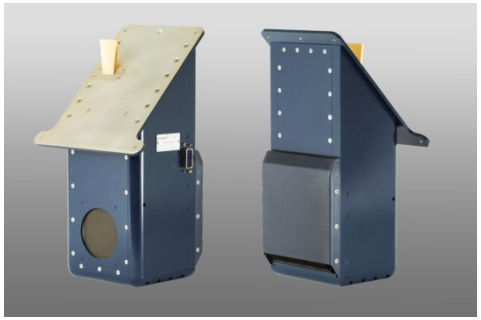
Near-range sensors – an overview

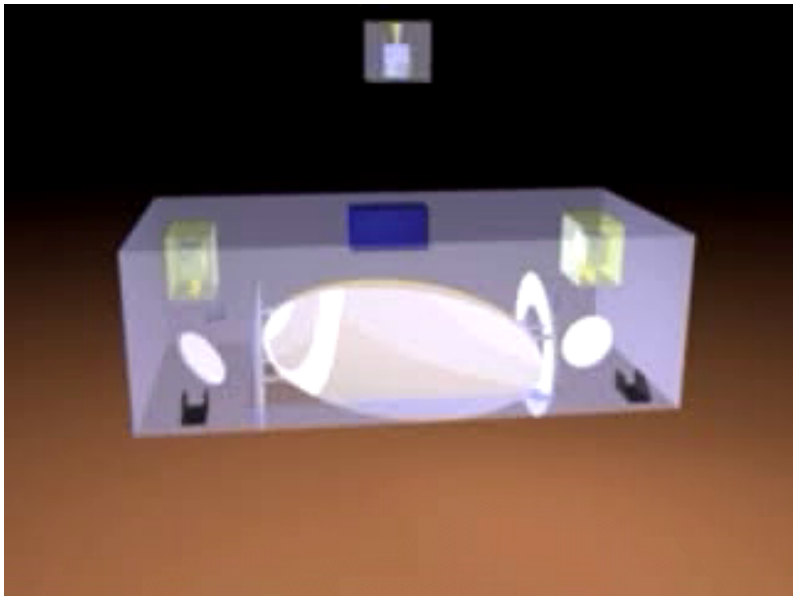


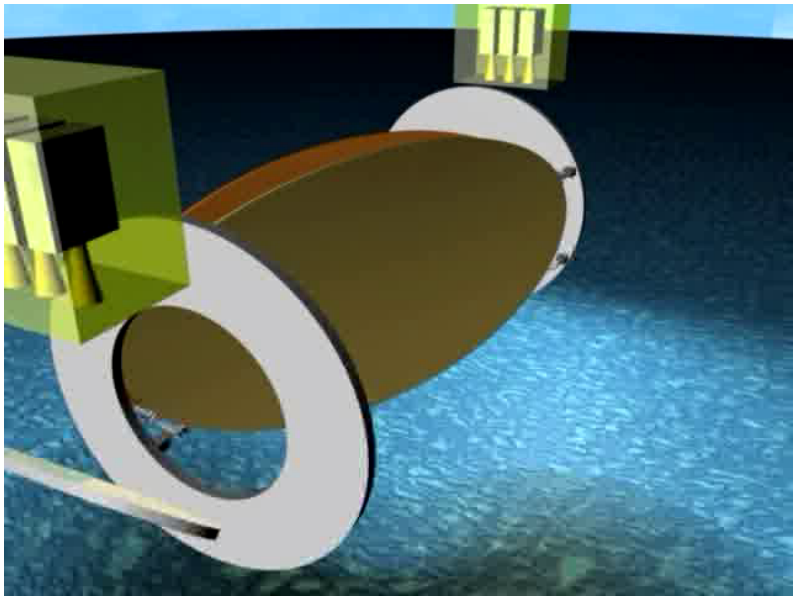
Geo-referenced mapping



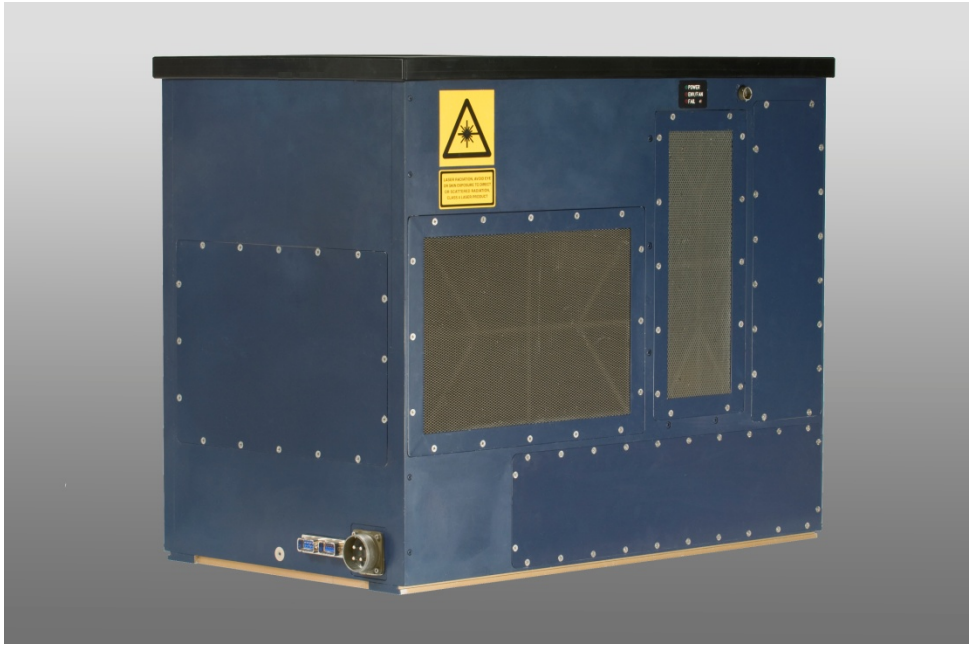
Layout and function of the OPTIMARE MWR







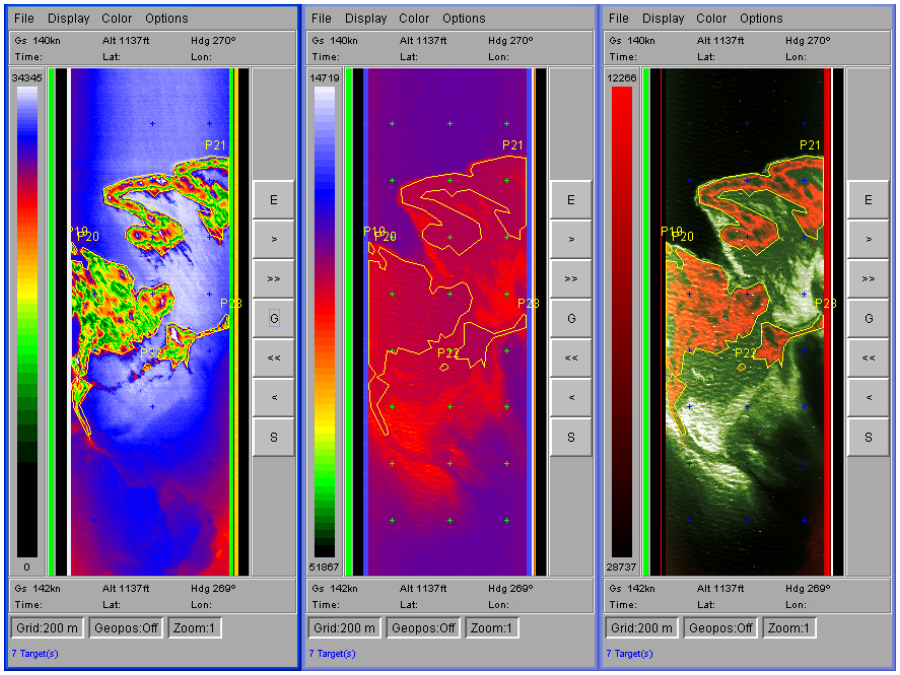
OPTIMARE Laserfluorosensor (LFS)

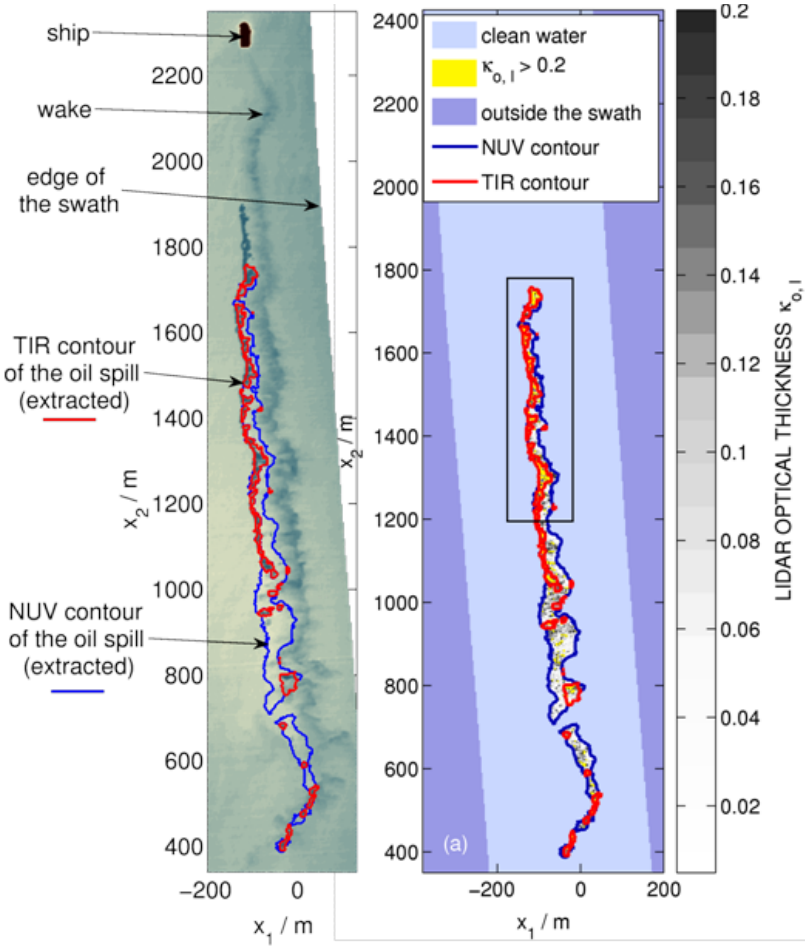


Classification Scheme

- Bilge oil
- Diesel
- Lubricating Oil
- Light refined
- Very light refined
- Very light crude (type I)
- Very light crude (type II)
- Light crude
- Medium crude
- Heavy crude
- Sea Water
- Biogenic oil
- Chlorophyll *a*

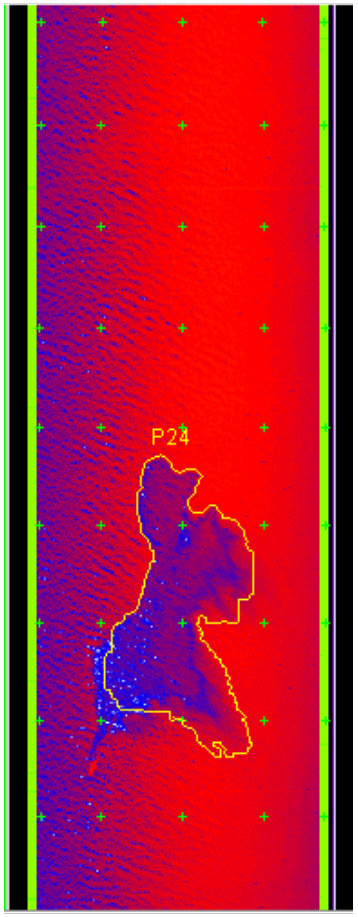
Enhanced analysis of remote sensing data





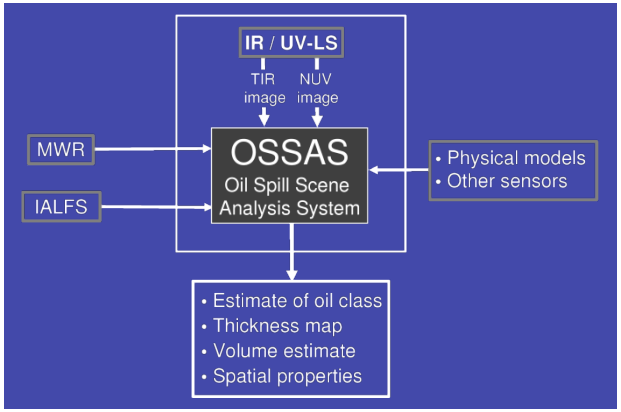
- Sensor fusion
  - Example: Oil spill monitoring
    - data fusion by OSSAS

Automatic Scene Analysis



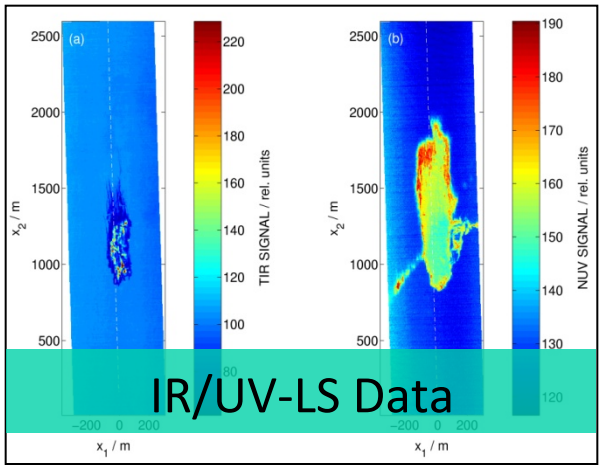
Feature extraction through automatic image segmentation for determination of properties like

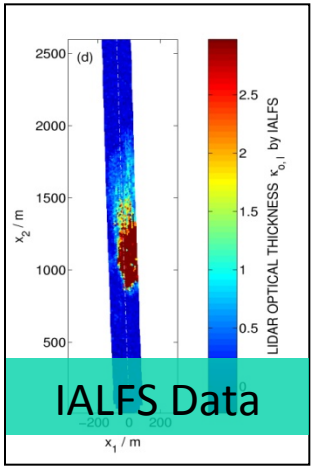
- Area
- Center of mass
- Length x width



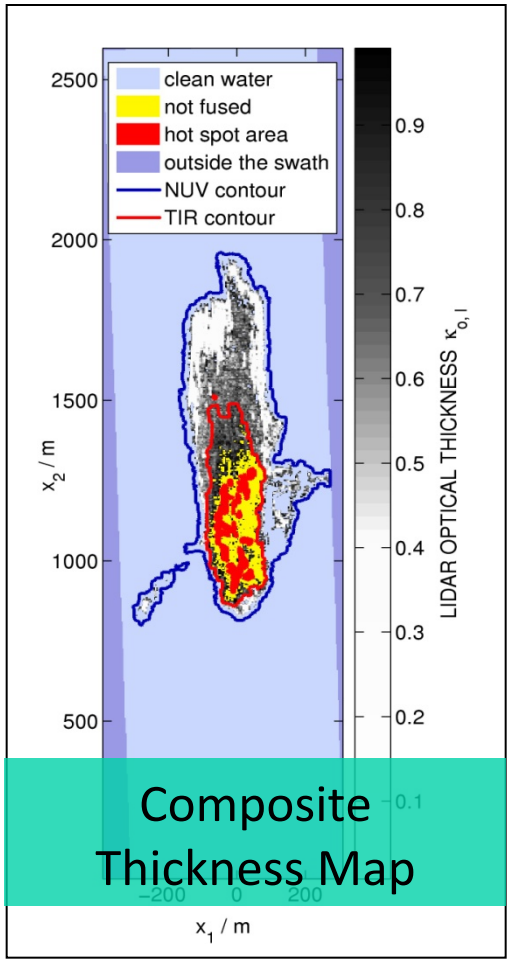
N. Robbe, O. Zielinski, *Airborne remote sensing of oil spills – analysis and fusion of multi-spectral near-range data*. J Mar Sci Enviro C.2: 19-27, 2004.

Fusion of near-range data using the
Oil Spill Scene Analysis System (OSSAS)

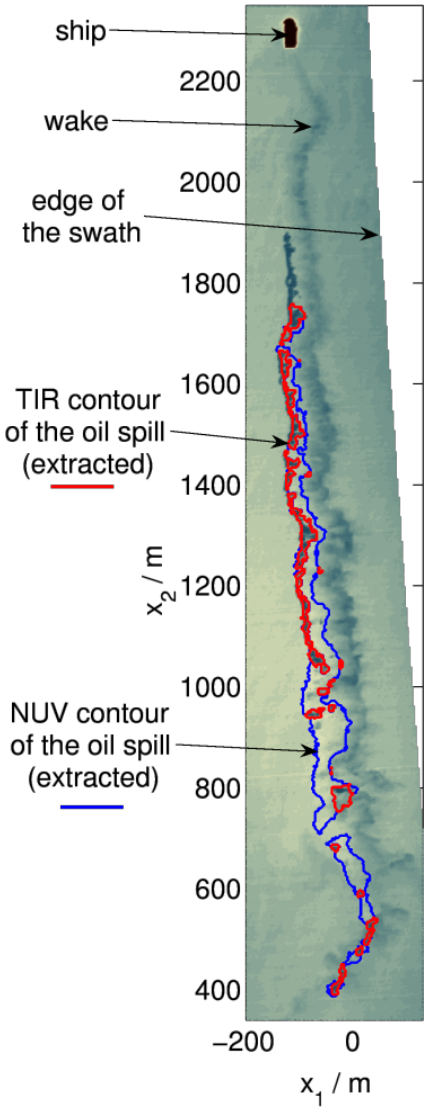




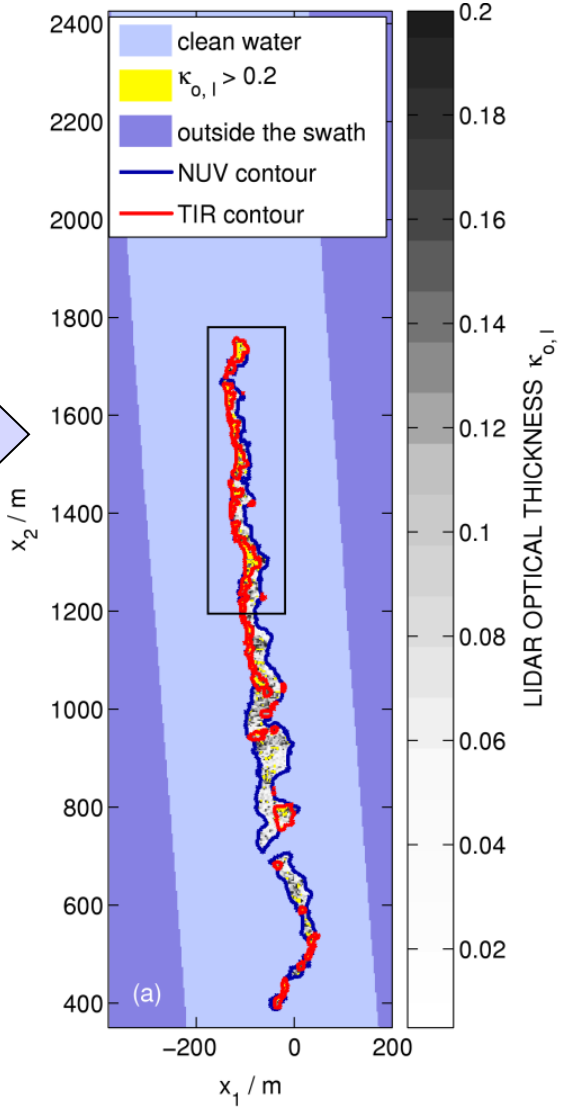
Fusion

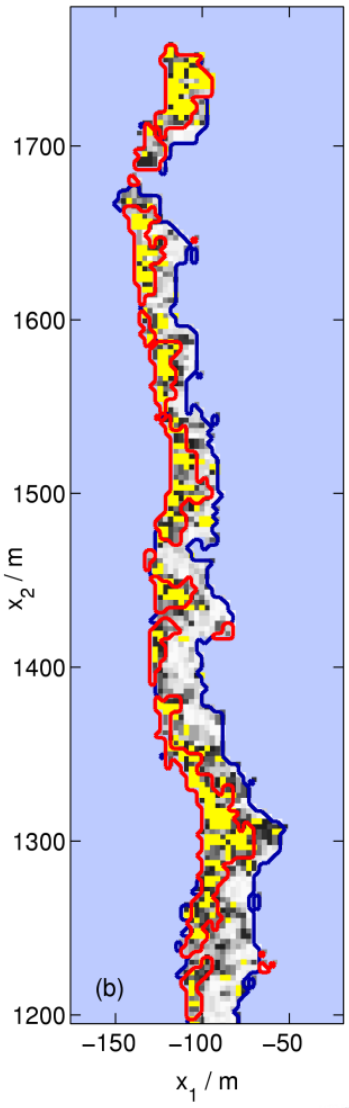


Data analysis



Fusion





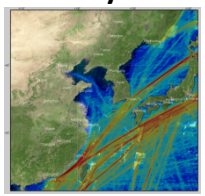
Data distribution by Web GIS

Service	*Data*	*Geo Portal*	*Internet access*	*User group*

Airborne surveillance

Space-borne surveillance

Ancillary data

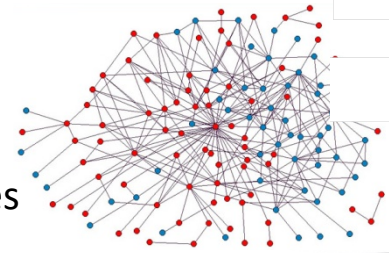


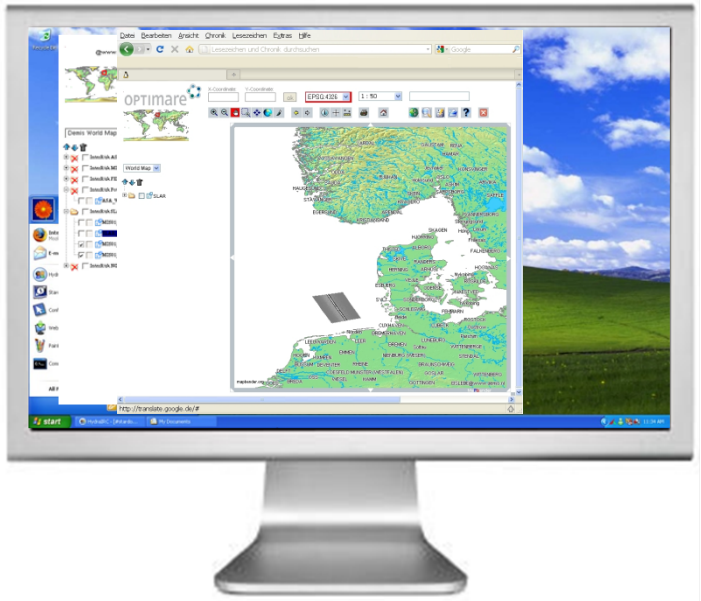
MEDUSA
GEO PORTAL

Web Service
Integrated processing

- Web Coverage Service
  Web Map Service
  Web Feature Service
- Public data
- Protected data

External
web services





Restricted access
Example: Marine crisis management

Thank you for your attention

OPTIMARE

Email: nils.robbe@optimare.de

Your partner for integrated airborne maritime surveillance