

**Big data: Development of value-added downstream services and applications**

# **Demand and supply of Big Earth Observation data – Some observations**

## **Session 3: Legal issues related to regulation of big data from space activities**

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DLR – German Remote Sensing Data Center -  
Earth Observation Center

20th European Interparliamentary  
Space Conference  
15-16 October 2018  
Brussels, Belgium







# DEMAND



# SUSTAINABLE DEVELOPMENT GOALS



Developed in collaboration with **TROLLBÄCK+COMPANY** | [TheGlobalGoals@trollback.com](mailto:TheGlobalGoals@trollback.com) | +1.212.529.1010  
For queries on usage, contact: [dpicampaigns@un.org](mailto:dpicampaigns@un.org)





Where can Earth Observation help

No Poverty

Zero Hunger

Good Health and Well-Being

Quality Education

Gender Equality

Clean Water and Sanitation

Affordable Clean Energy

Decent Work and Economic Growth

Industry, Innovation and Infrastructure

Reduced Inequalities

Sustainable Cities and Communities

Responsible Consumption and Production

Climate Action

Life below Water

Life on Land

Peace, Justice and Strong Institutions

Partnership for the Goals



# Copernicus Core Services



LAND



ATMOSPHERE



EMERGENCY



CLIMATE



MARINE



CIVIL SECURITY

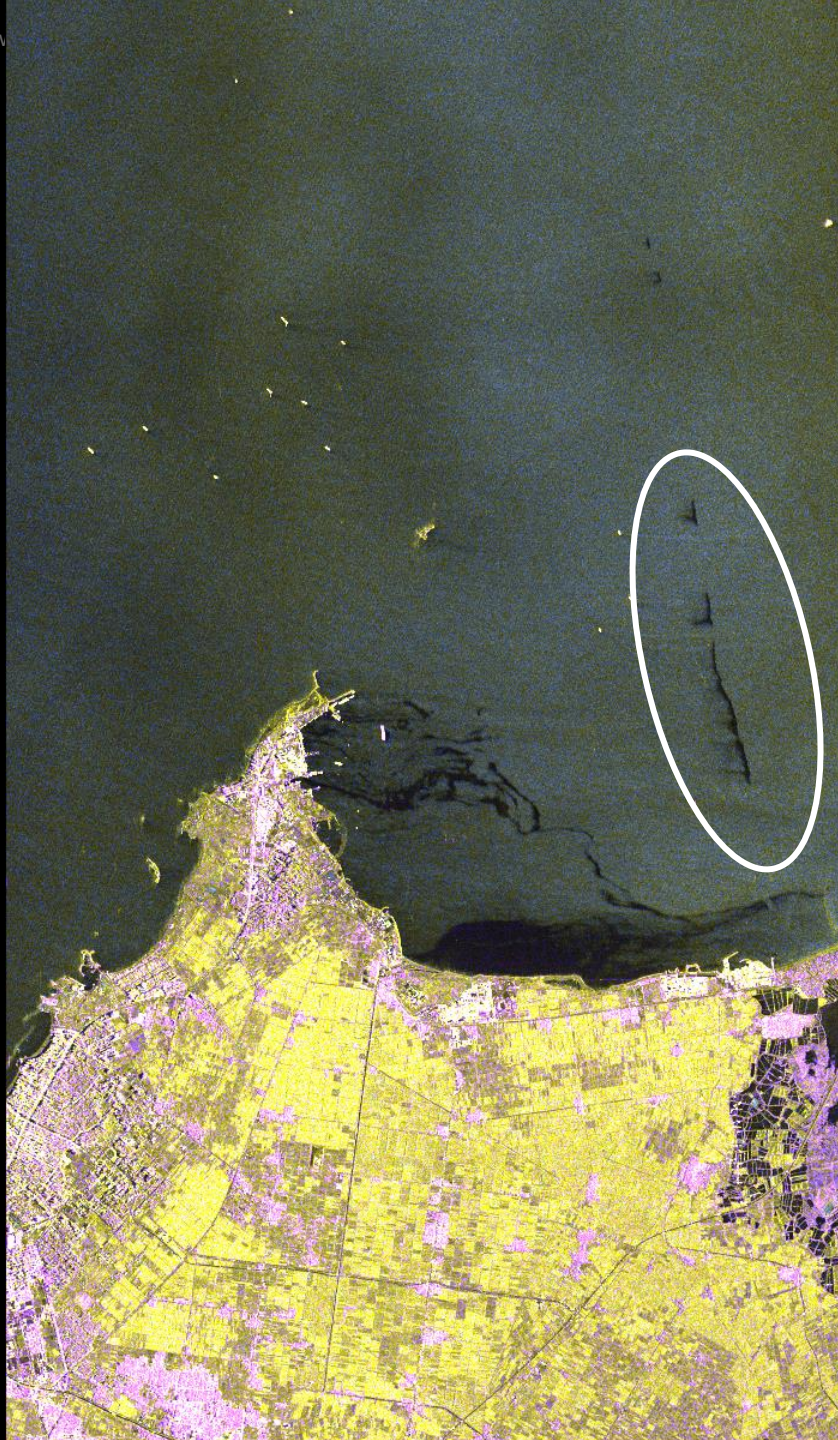






© Maxppp

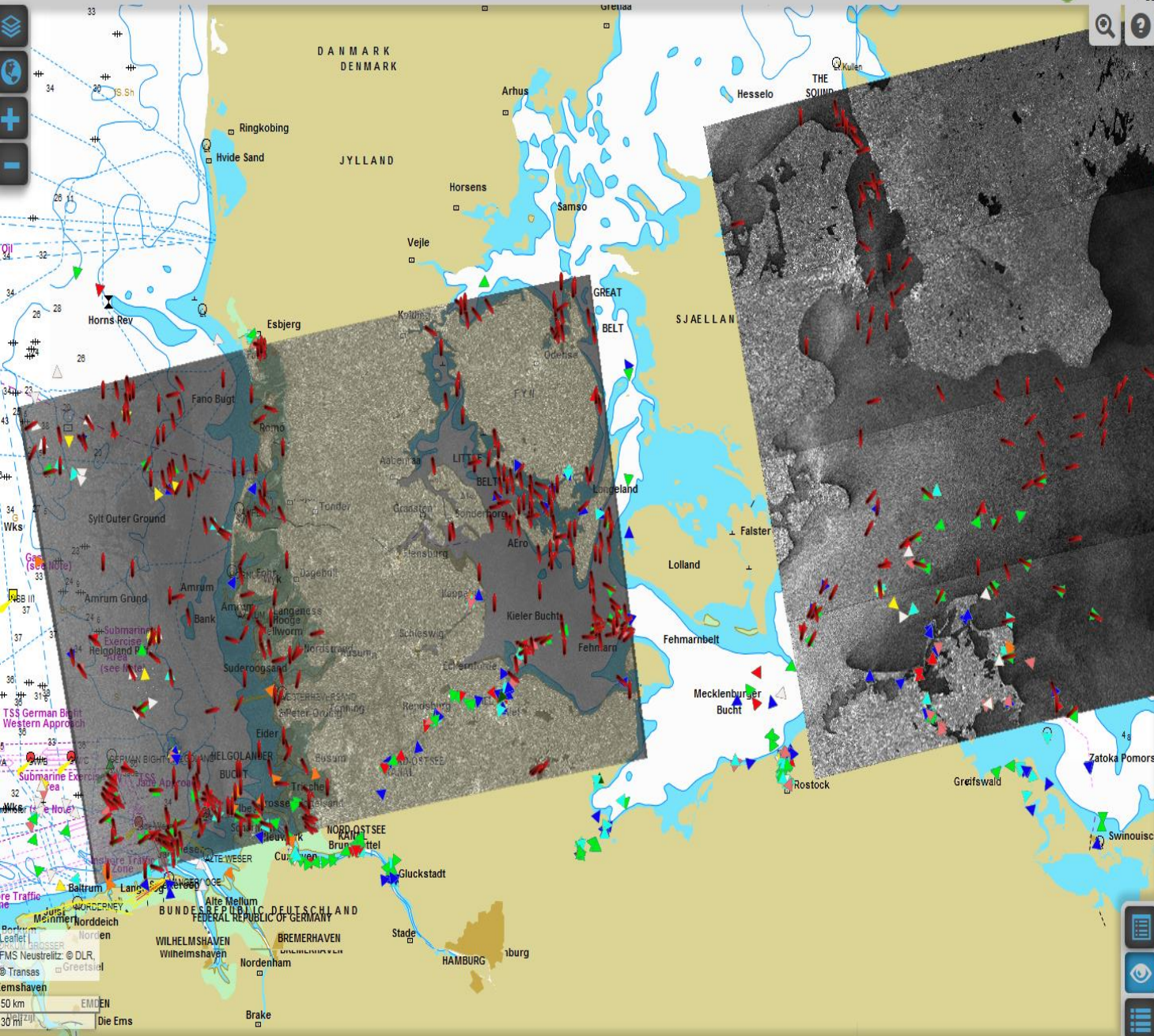










The image of the 2017 is acquired in the Mediterranean Sea near Alexandria. In the top left spill it is a platform. In the bottom right (not the black area attached to the coast) it seems a "classical" spill from moving ship (there is a segmented trail with wind E-W "transporting" the oil in the same direction).

TerraSAR-X © DLR




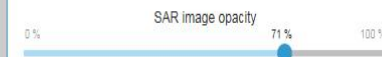


## Selected products

Sensor	Time	
S1A	2015-08-09T17:08:55	
TSX	2015-10-20T17:24:39	
TDX	2013-09-17T16:44:48	
TDX	2013-09-17T16:44:56	
TDX	2013-09-17T16:45:12	
TDX	2013-09-17T16:45:04	

## Layers

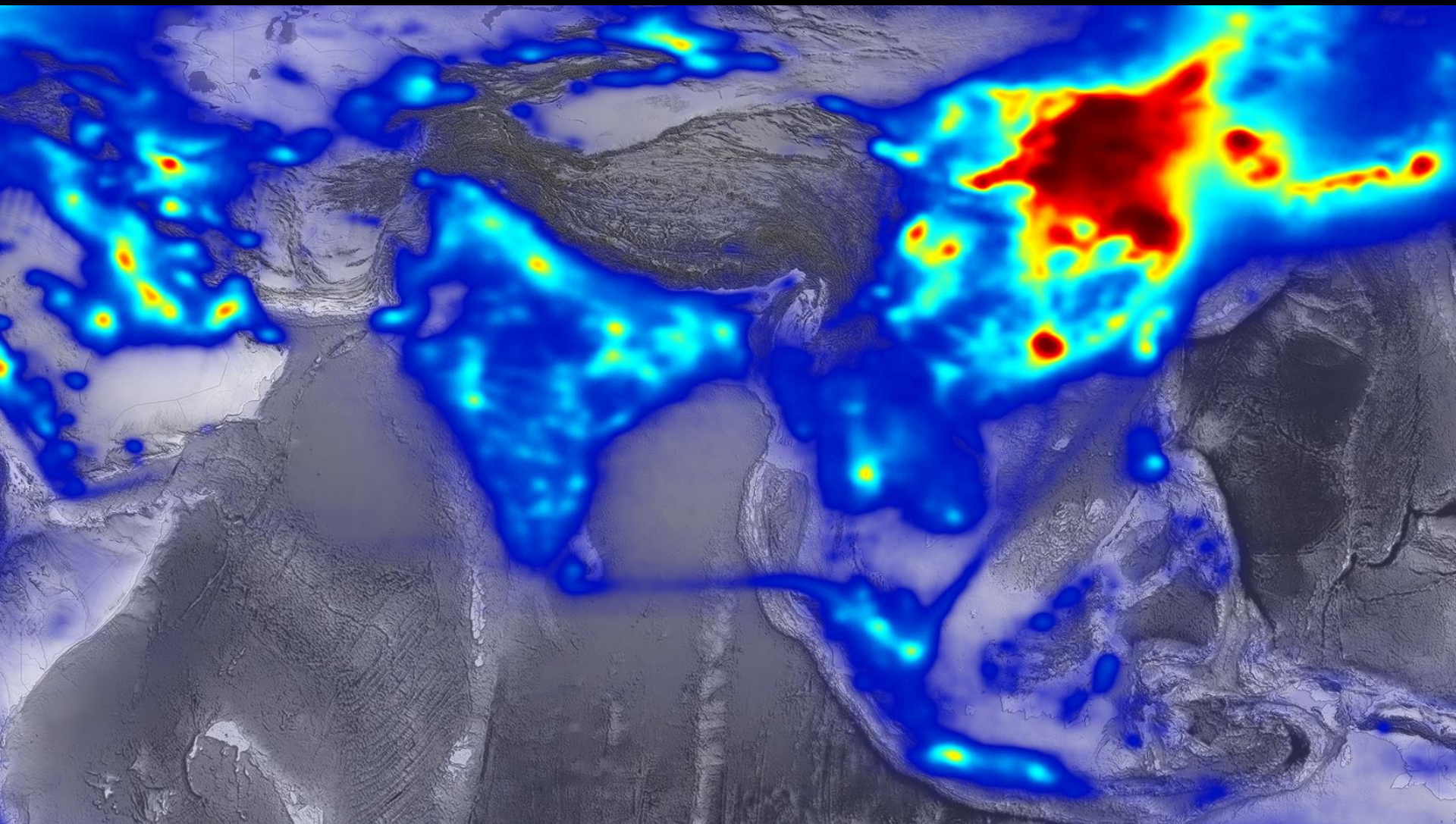
 SDP product	
 AIS layer	
 SAR image	





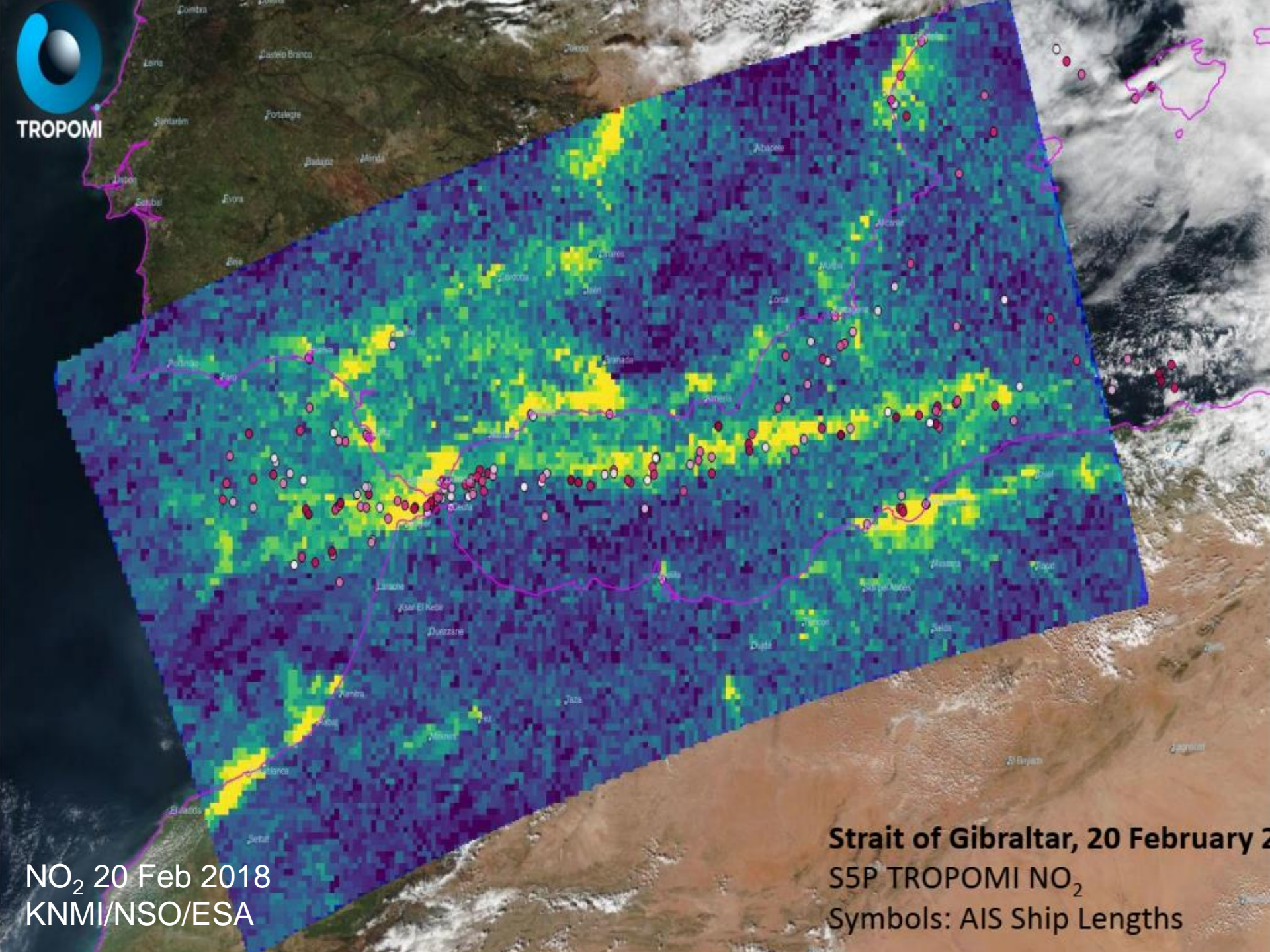
Greenhouse gas emissions of EU's shipping sector are substantial, representing 4% of the EU's total GHG emissions in 2013.  
©Fotolia, Diego Cardini





GOME-2 NOX 2007 – 2015 METOP © Eumetsat





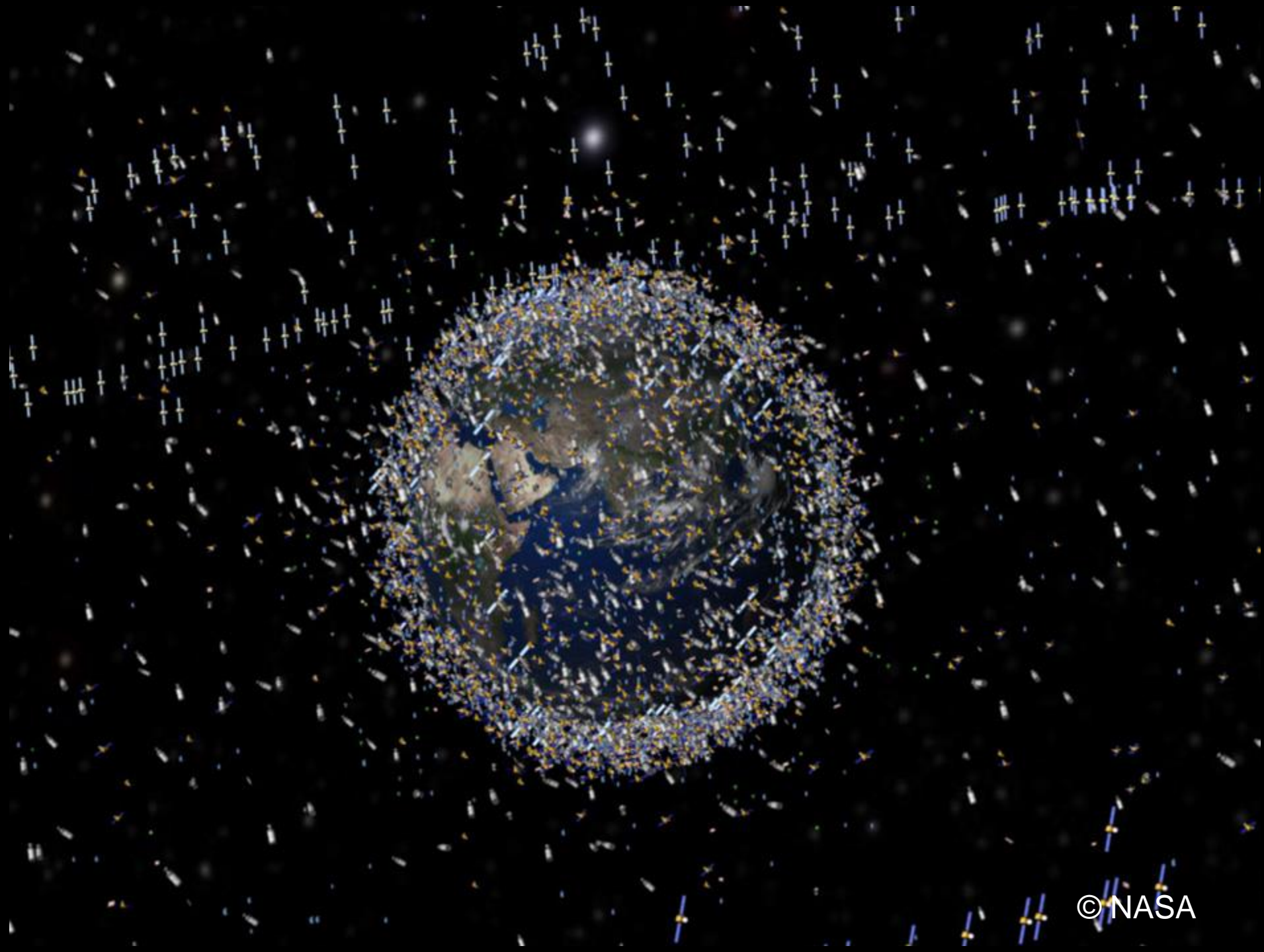
TROPOMI

NO<sub>2</sub> 20 Feb 2018  
KNMI/NSO/ESA

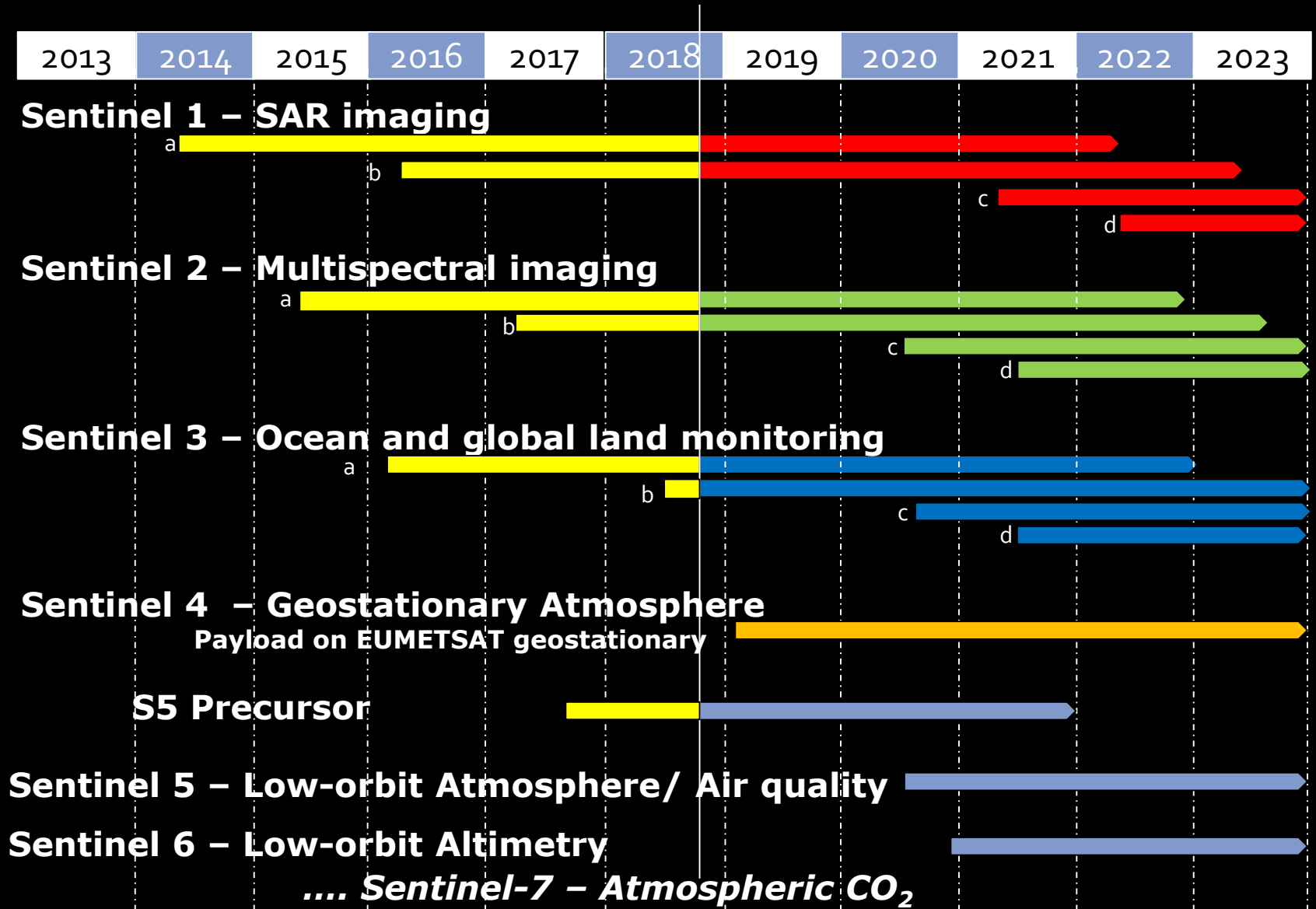
Strait of Gibraltar, 20 February 2018  
S5P TROPOMI NO<sub>2</sub>  
Symbols: AIS Ship Lengths

**SUPPLY**





# The Copernicus Sentinel Missions





# Copernicus – Data - Global

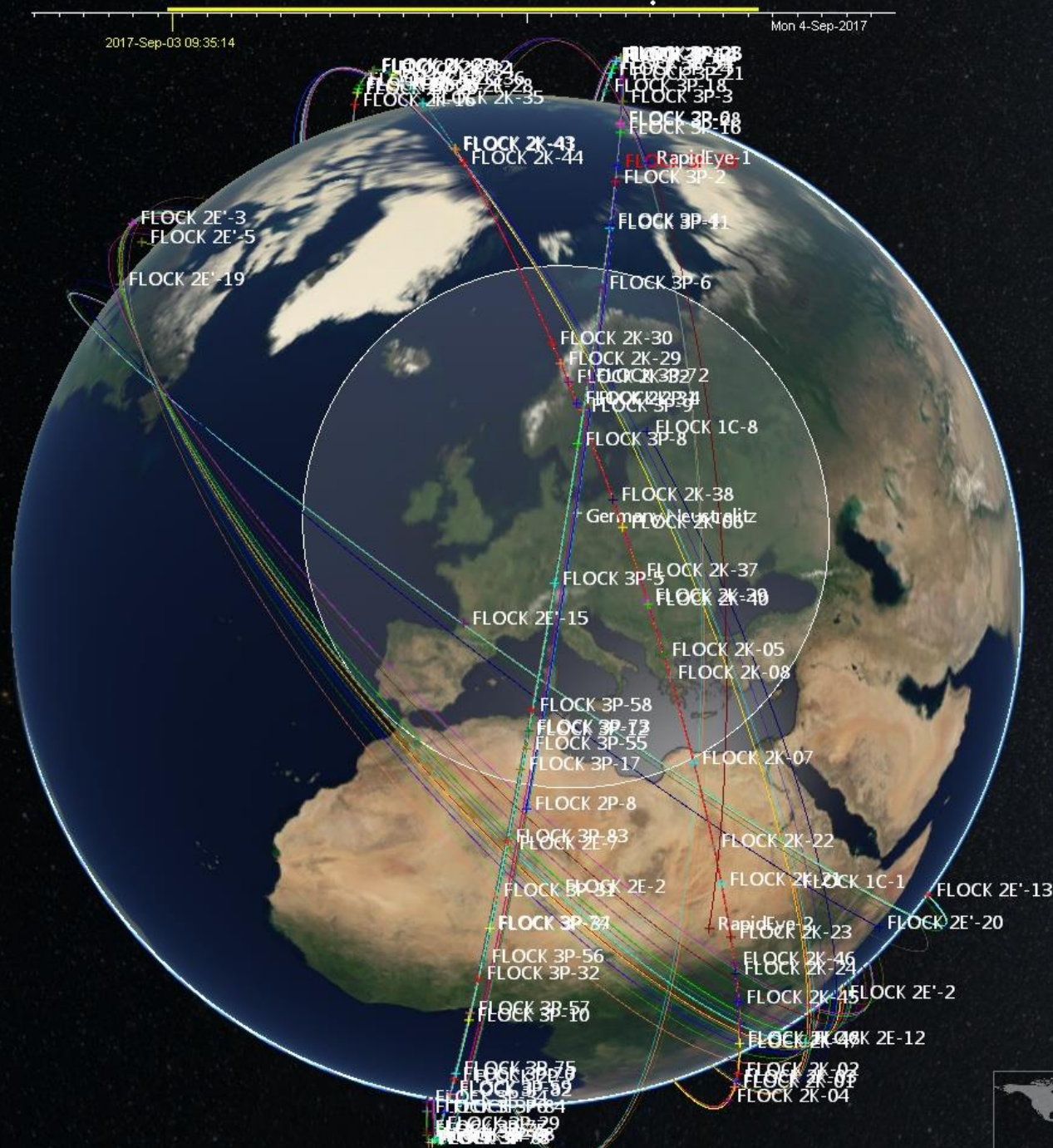


# Copernicus Sentinel Data Policy

**Sentinel Data Policy =  
FREE and OPEN access**







Watch the sky







# The „legal“ difference between „sky“ and „space“

## SPACE

- 1967 Outer Space Treaty
- 1986 UN Principles Relating to Remote Sensing of the Earth from Outer Space

~ 100km

## AIRSPACE

- 1944 Chicago Convention:  
national legislation apply, incl. prohibition of any airspace activity

Adapted from ISPRS response to UNOOSA 18.11.2017  
Frans G. von der Dunk  
University of Nebraska-Lincoln, College of Law

# ENABLERS

31<sup>ST</sup>

ANNUAL CONFERENCE ON SMALL SATELLITES

**SMALL SATELLITES**

**BIG DATA**

**AUGUST  
5-10  
2017**

LOGAN, UTAH  
USA

**KEYNOTE**

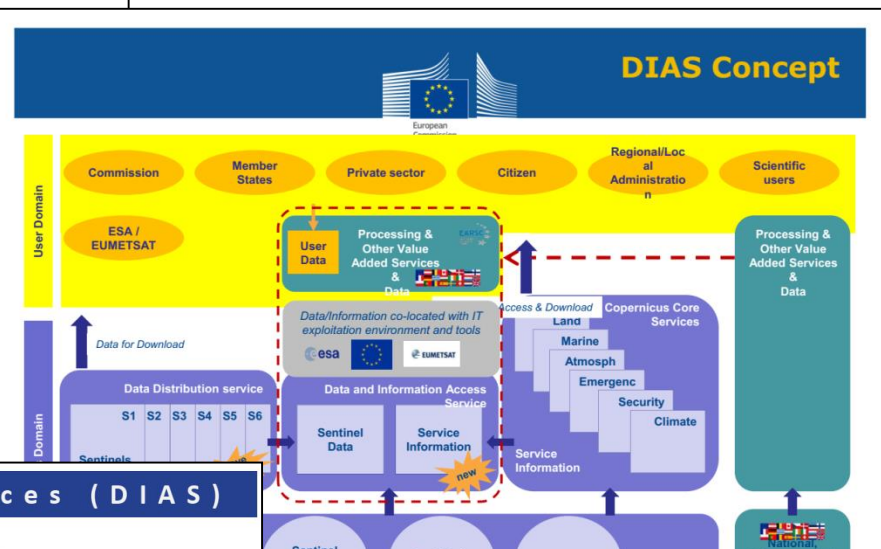
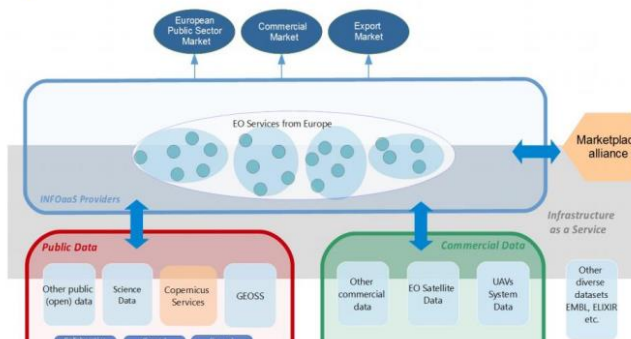
**DEVELOPING A  
NEW, EXPANDED,  
& TIMELIER  
UNDERSTANDING  
OF OUR WORLD!**





# A variety of systems

## EARSC Vision: European Marketplace



## Data & Information Access Services (DIAS)

**CREODIAS**  
<https://creodias.eu/>



**sobloo**  
<https://sobloo.eu/>



**mundi**  
 WEB SERVICES  
<https://mundiweb services.com/>



**ONDA**  
<https://www.onda-dias.eu/>



**Copernicus**  
 Sentinel open access



# www.code-de.org

Filter Ebenen

## ZEITLICHER FILTER ▾

Karte und Filter verwenden denselben Zeitraum

2017-08-02 00:00:02 - 2017-08-12 00:37:23

Start

2017-08-02 00:00:02

Ende

2017-08-12 00:37:23

## RÄUMLICHER FILTER ▾

Koordinaten sind in Grad angegeben (geographische Länge und Breite) WGS84

Zeichnen

☐ Punkt ☐ Rechteck ☐ Polygon

Hochladen

Suche Keine Datei ausgewählt

Feature auswählen ▾

Momentane Auswahl

10.7664988 - 47.857883E - 11.810200C - 48.6379131

Zur Auswahl zoomen

Auswahl löschen

## ZUSÄTZLICHE FILTER ▾

Production Status ▾

Cloud Cover

Orbit Direction ▾

Orbit Number

Resolution

Platform Serial Identifier

Processing Level

Polarisation Mode ▾

Polarisation Channels ▾

Antenna Look Direction ▾

Minimum Incidence Angle

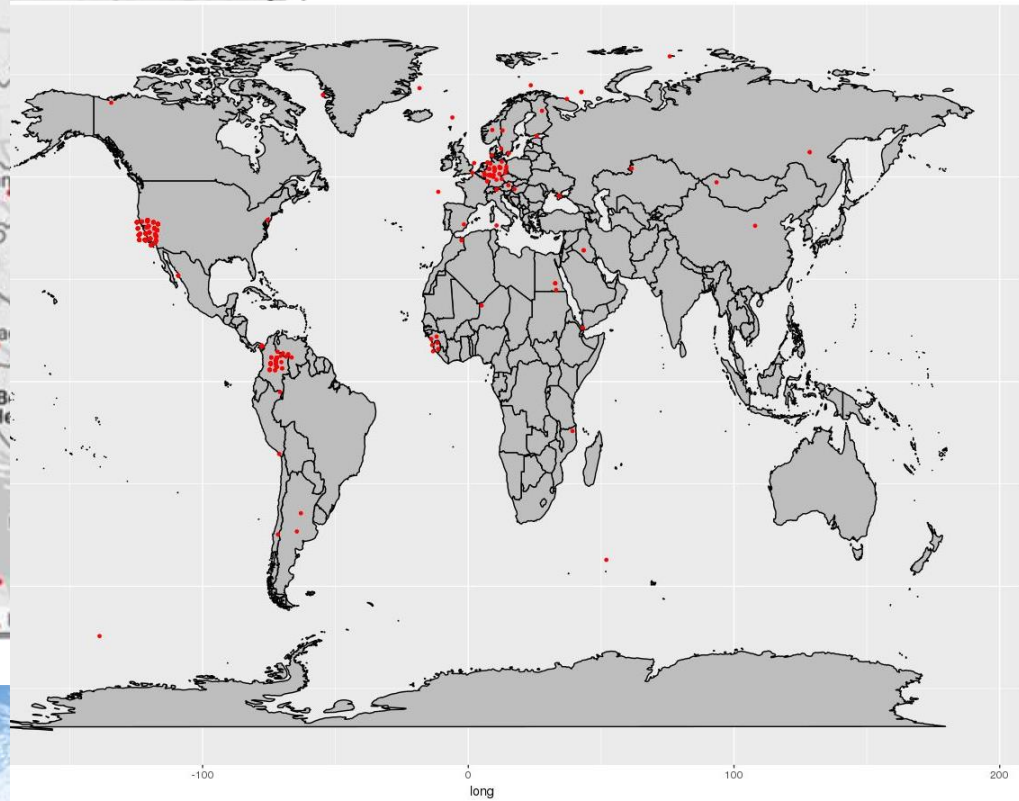
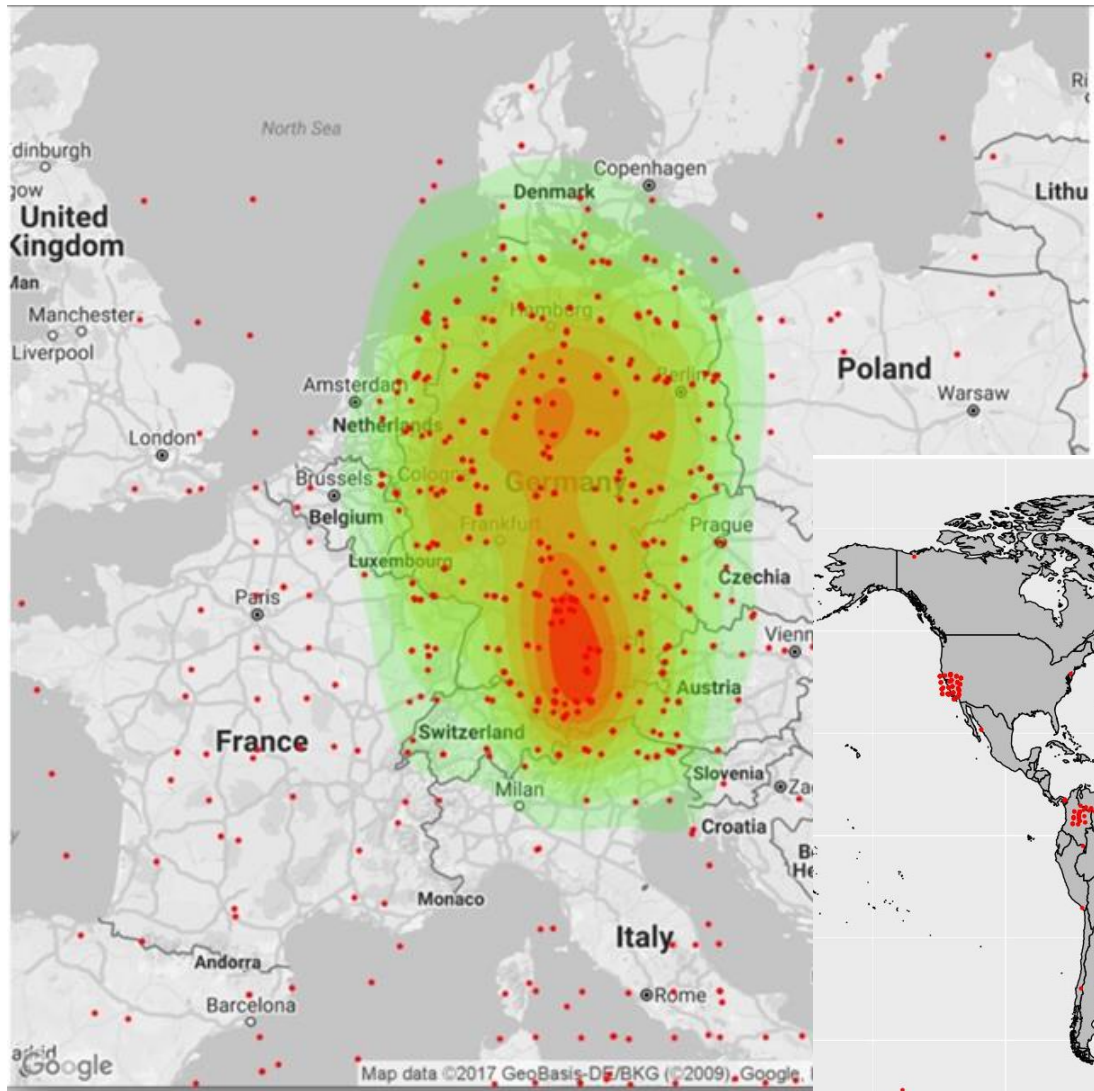
Maximum Incidence

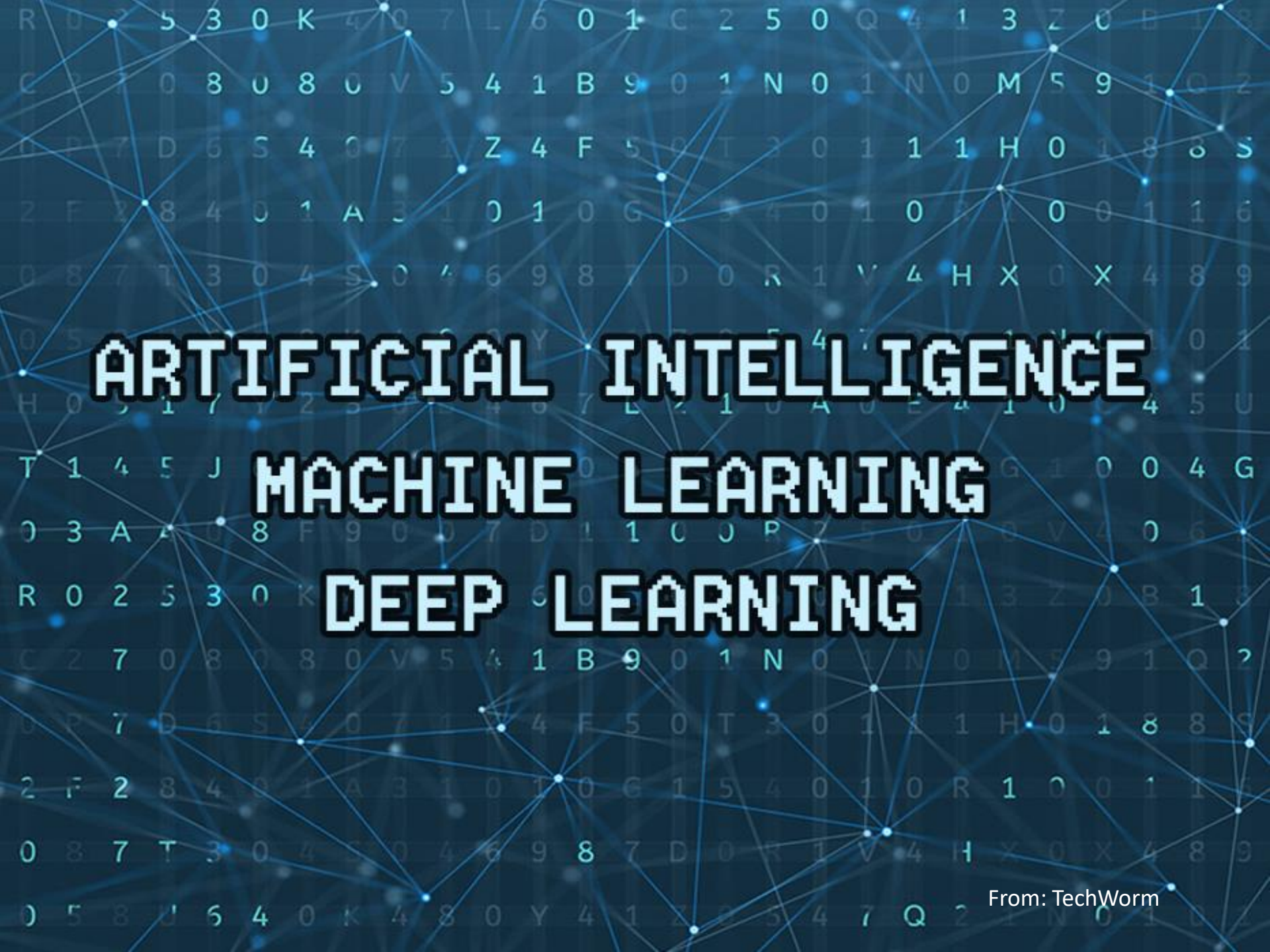


13.08, 47.15



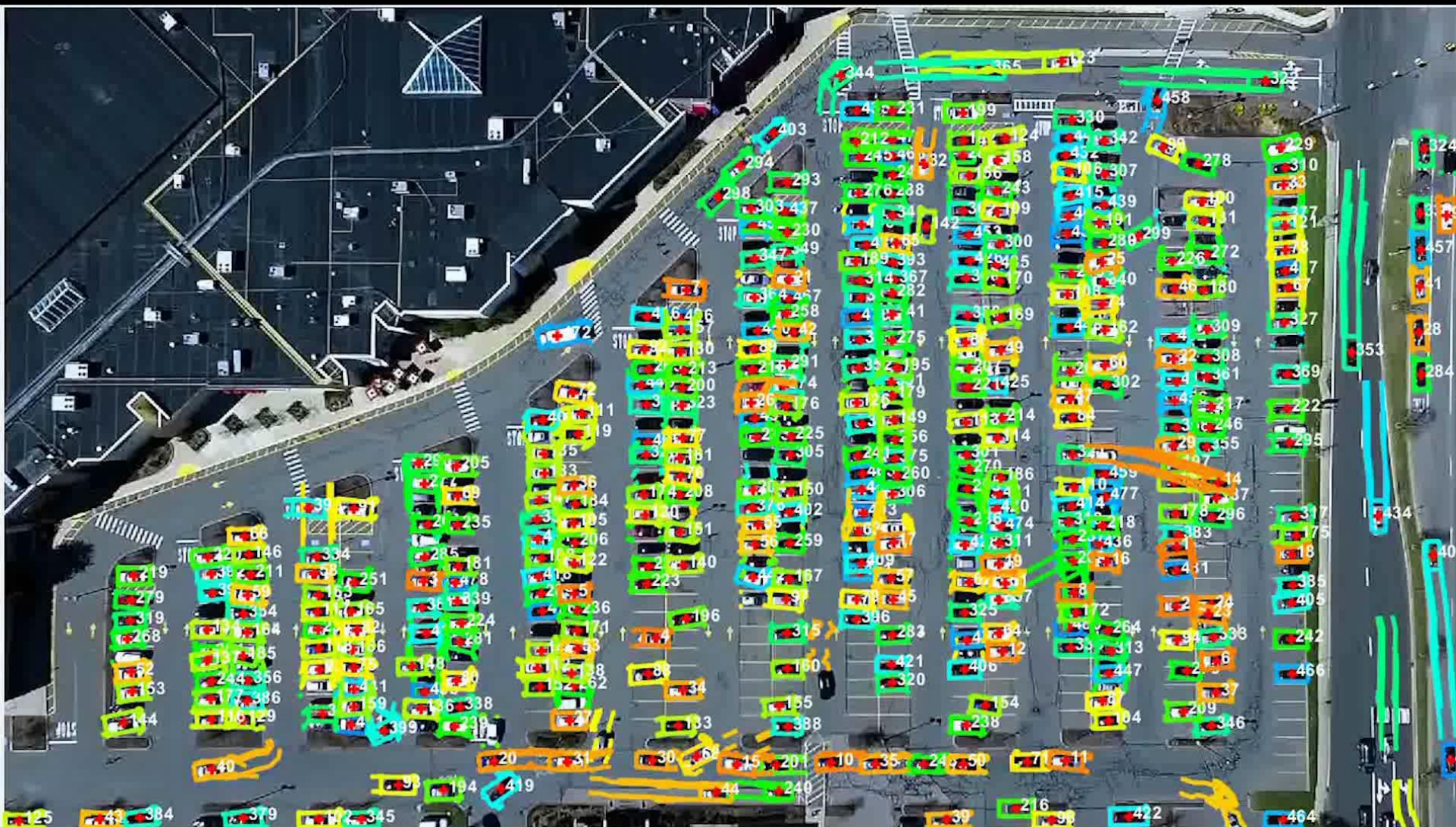
# CODE-DE – Areas of User's Interest





# ARTIFICIAL INTELLIGENCE MACHINE LEARNING DEEP LEARNING





Data source: UAV based video take  
 Courtesy: Zhu et al., DLR-EOC-IMF



# SAP Digital Boardroom

## Use Case Example



# The Diggers



The Enabler