



**EARTH
CUBE**

The logo for Earth Cube features the word "EARTH" in a bold, dark blue sans-serif font above the word "CUBE" in a similar font. To the right of "CUBE" is a white hexagon containing a stylized blue cube icon with a black diamond-shaped cutout on one of its faces.

Introduction

Mission

Combine AI & GEOINT to offer the first monitoring solution at scale

Customers

Security
& environment

Defense

Economic
intelligence

Partners



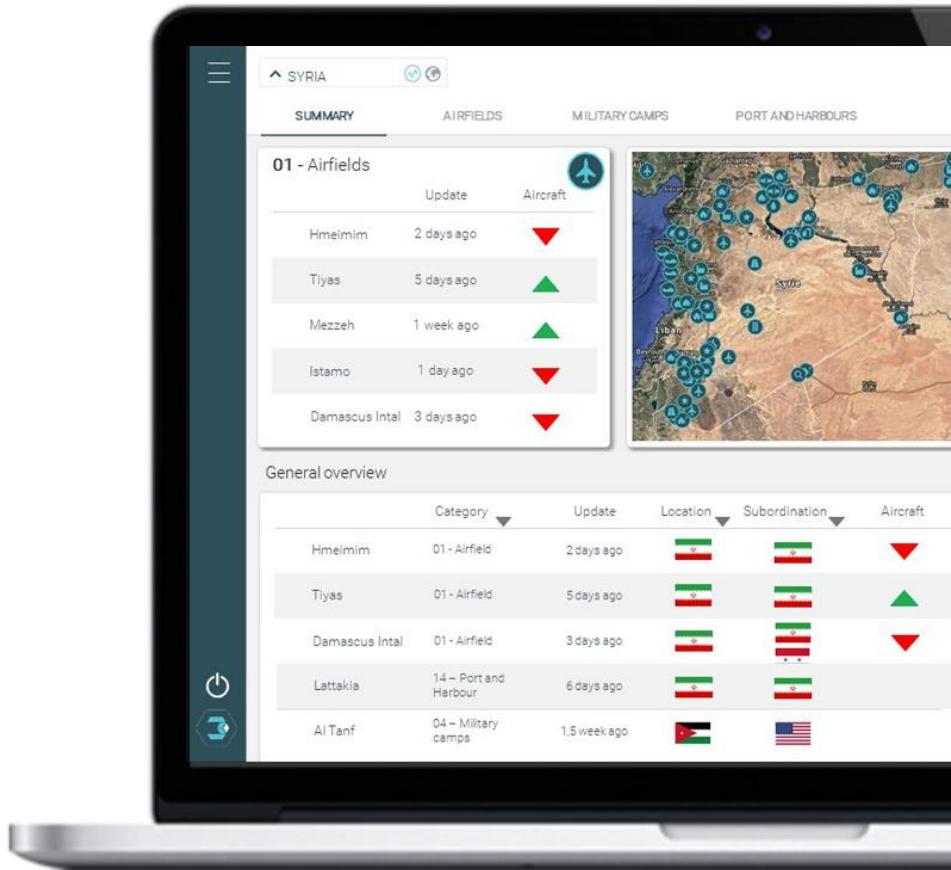
Team



“+95% of intelligence data gathered is never looked at”

*A senior French MoD official
BFM business, October 5th, 2018*

Our vision



Enabling analysts to focus
on understanding
situations

by automating detection of
events of interest

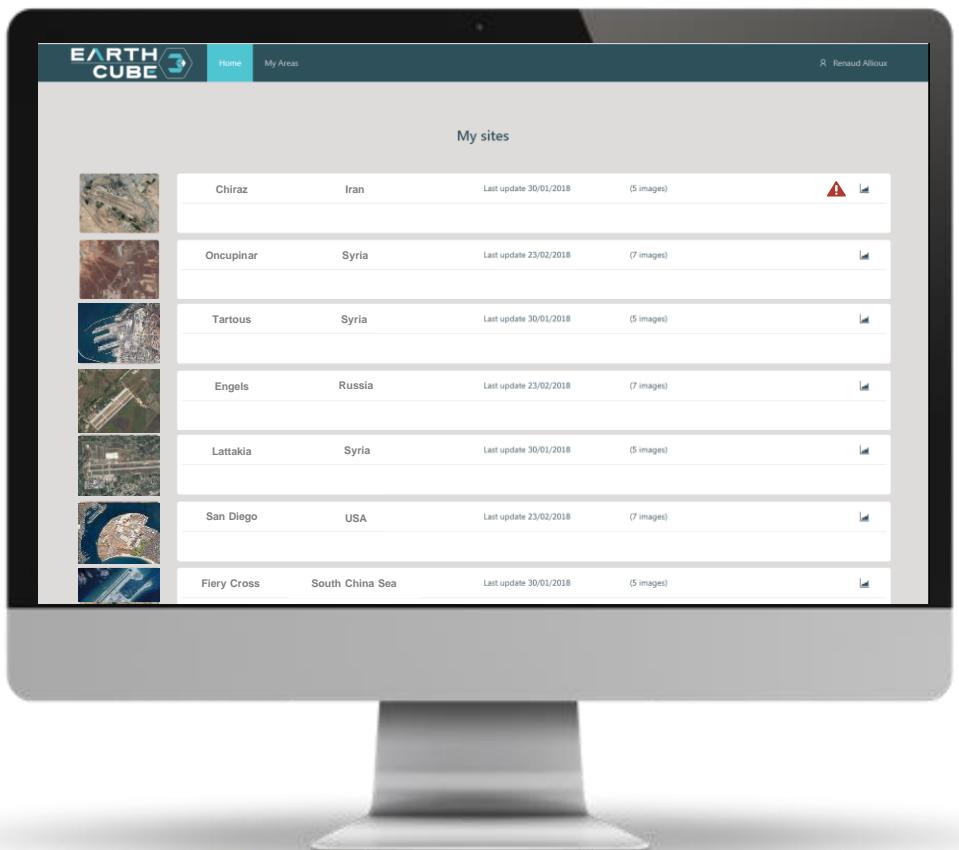
on 1000x sites, every day

S-Cube

End user perspective

The infrastructure to get there

S-CUBE : strategic site surveillance



Systematic activity evaluation

AI based automatic feature extraction

Queryable geodatabase of enriched objects

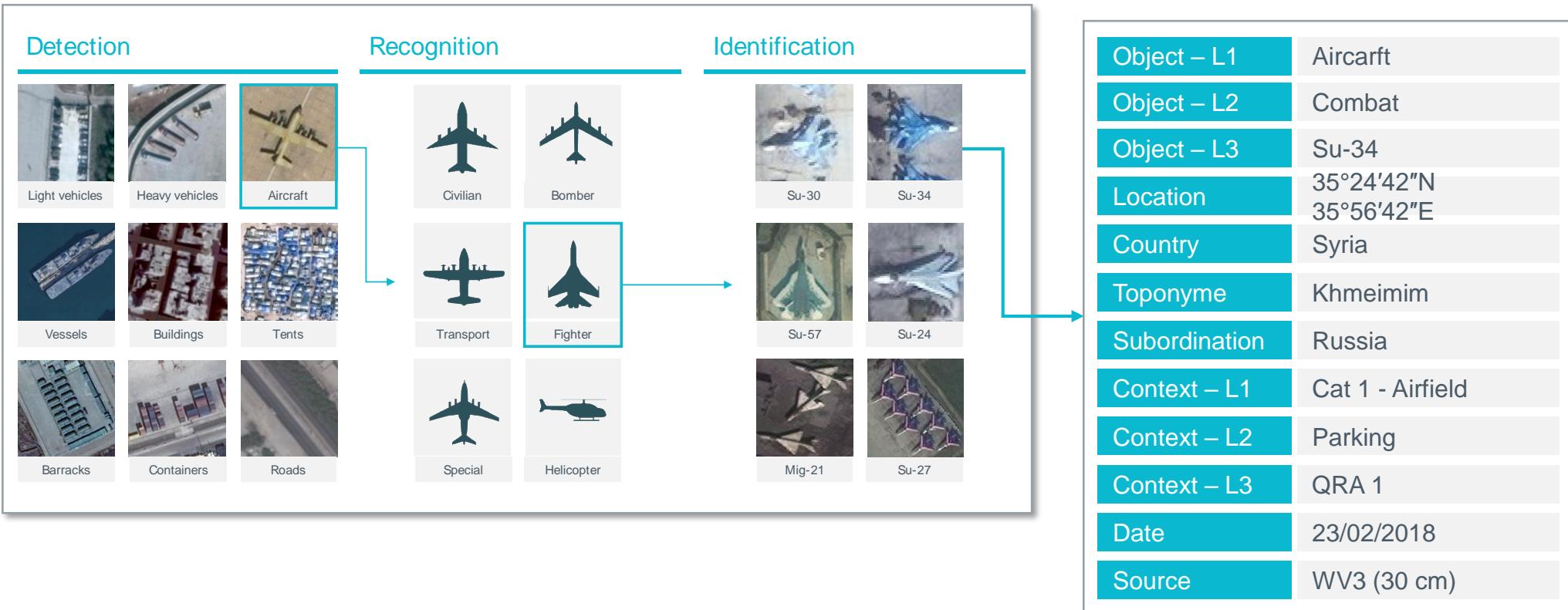
Analytics

Systematic activity evaluation (STANAG 3596)

Leveraging military & human geography



AI based automatic feature extraction feeding enriched geolocalized object database



Site list

Earthcube Platform x + <https://app-preprod.earthcube.eu/areas> ... ☆ Rechercher ↓ ll ABP ...

My sites

Syria

| Toponym | Country | Last update | Alert status | Indicators |
|----------|---------|-------------|---|------------|
| Hmeimim | Syria | 08/11/2018 | -An abnormal activity related to Combats has been detected in the sub-area QRA parking | |
| Latakia | Syria | 08/11/2018 | -An abnormal activity related to Fast attack crafts has been detected in the sub-area Naval | |
| Tartus | Syria | 02/11/2018 | -An abnormal activity related to Submarines has been detected in the sub-area Naval - #Russian area | |
| Mezzeh | Syria | 02/11/2018 | | |
| Damascus | Syria | 31/10/2018 | | |
| Istamo | Syria | 05/08/2018 | | |

Dashboard

Earthcube Platform + X

https://app-preprod.earthcube.eu/areas

Rechercher

Misrata Libya 20/05/2017

Derna Libya 09/06/2017

Tripoli Libya 08/06/2017

Benghazi Libya 20/05/2017

Brega Libya 07/04/2017

Russian Federation

| Toponym | Country | Last update | Alert status | Indicators |
|--------------|--------------------|-------------|--------------|--------------|
| Novorossiysk | Russian Federation | 08/11/2018 | | |
| Sevastopol | Russian Federation | 31/10/2018 | | |
| Engels | Russian Federation | 27/10/2018 | | car airplane |

Map

Earthcube Platform + X https://app-preprod.earthcube.eu/misrata/dashboard ... Rechercher Saturday May 20th, 2017 PDF report

Libya / Misrata Map

Military activity General information

Alert status

An abnormal activity related to Civilian vessels has been detected in the sub-area Pier & quay - #4

General overview Ships

462

Ships activity evolution

Cargo ship: 8

Civilian vessel: 219

Support ship: 4

Split per category

272

Trend

Civilian

Commercial

30

Split per area

Civilian: 272

Commercial: 30

Type Areas

Researching specific indicators in geospatial database

United Nations

S/RES/2441 (2018)



Security Council

Distr.: General
5 November 2018

3. *El Mukhtar* first seizure

78. On 1 May 2017, the European Union military operation in the Southern Central Mediterranean (EUNAVFOR MED Operation SOPHIA) inspected the vessel *El Mukhtar* in international waters off the coast of Libya. The vessel had departed from the port of Misratah and was reported by the master to have been heading to Benghazi. During the inspection, numerous weapons, ammunition and associated materiel were discovered and subsequently seized by EUNAVFOR as they had been transferred out of Libyan territorial waters. The majority of these items were subsequently made available for inspection by the Panel, with the exception of a rocket-propelled grenade launcher and a rocket-propelled grenade, which had been disposed of for safety reasons. Examples of the items seized are shown in annex 22.

Self contained rocket launch systems

Picture 1 RPG 26



Source: Panel of Experts, September 2017

Picture 2 RPG 27



Source: Panel of Experts, September 2017

Picture 3 RPG 27



Source: Panel of Experts, September 2017

Zoom on targeted ship

S Earthcube Platform X + https://app-preprod.earthcube.eu/misrata/map Rechercher Saturday May 20th, 2017

Libya / Misrata

14-Port and Harbour

- All
- Dock
- Pier & quay - #1
- Pier & quay - #2
- Pier & quay - #3
- Pier & quay - #4
- Pier & quay - Bulk terminal
- Shipbuilding - #1
- Shipbuilding - #2

100m

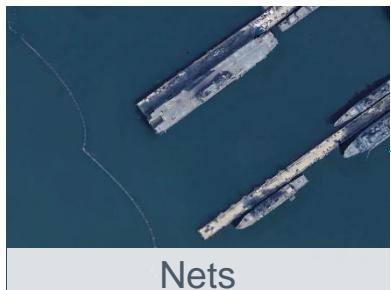
Alerts: customizable, supervised, unsupervised



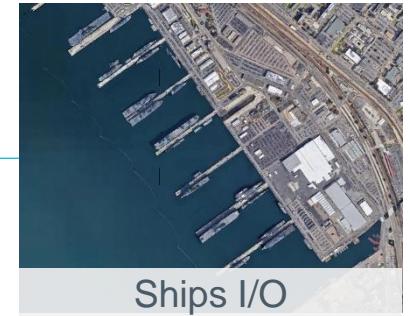
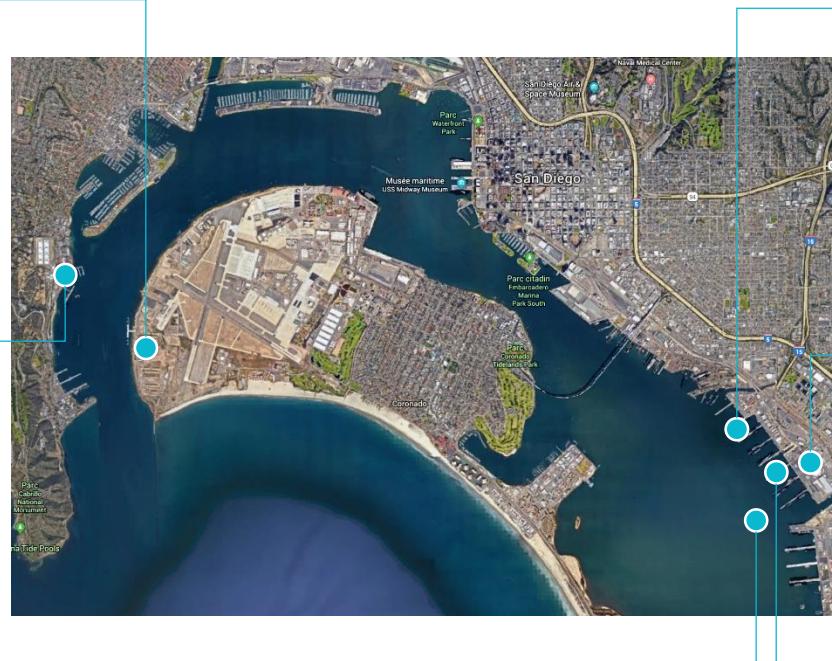
Ammunition depot



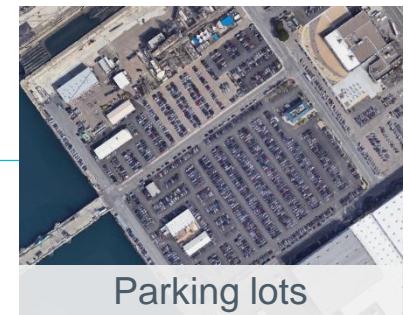
Refueling



Nets



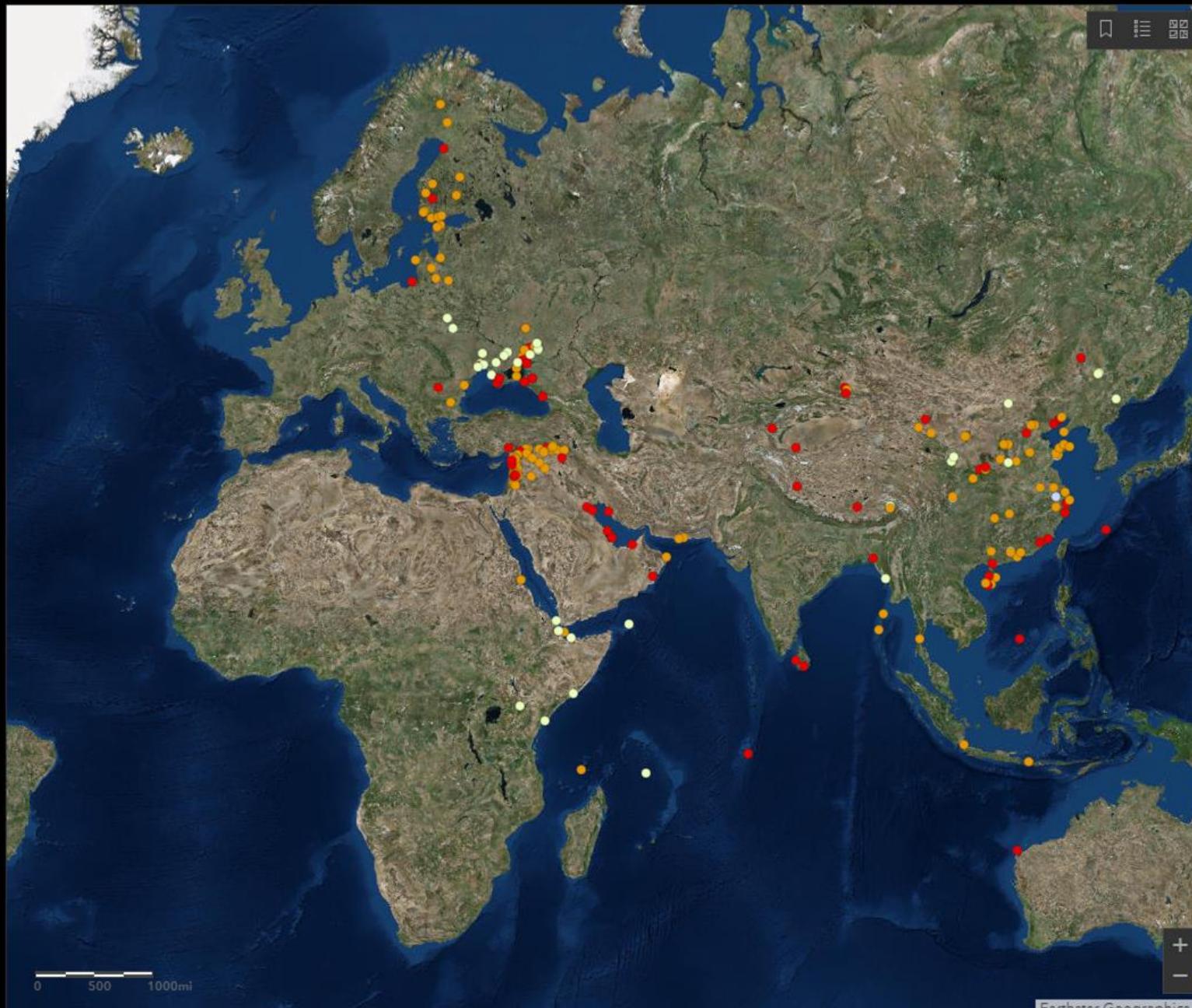
Ships I/O



Parking lots



Docs logistic



⚠ 50 alerts

Dernière mise à jour : il y a quelques secondes

Alerts Details

- Khmeimim Air Base - Syria
2 alerts
- LATAKIA - Syria
2 alerts
- Aghajari (Omidiyeh ?) - Iran
1 alerts
- Bandar-e Khomeini - Iran
1 alerts
- BANIYAS - Syria
1 alerts
- BARZAH - Syria
1 alerts

Dernière mise à jour : il y a quelques secondes

New updates

- Khmeimim Air Base - Syria
3 update
- Lashkar Abad - Iran
3 update
- 47th Brigade Division Base - Syria
2 update
- Aghajari (Omidiyeh ?) - Iran
2 update
- AL NASRYEH - Syria
2 update
- ALTANF 1 ET 2 - Syria
2 update
- Al Udeid Air Base - Qatar
2 update

Dernière mise à jour : il y a quelques secondes

Combining with other data sources



Activity as of

15/04/2018

Number of alerts

1

Last update: a few seconds ago

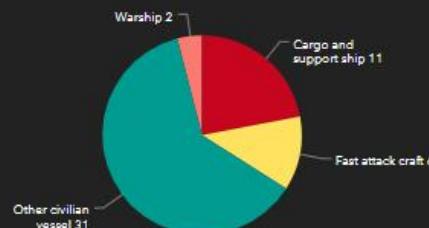
Overview of the alerts

Major decrease of fast attack craft

[Link to Hmeimim site](#)



Vessel distribution on 2018, April 15th



AIS data over the past week



Temporal evolution over the past six month

Fast attack craft

Warship

Cargo and support ship

Civilian vessels



Evolution

2016-04-0...

2016-04-1...

2016-05-2...

Sum of variation tents area_

2016-04-06 & 2016-04-19 evolution**↑ 20 220,00 m²**

Sum of variation tents area

2016-04-19 & 2016-05-22 evolution**↑ 3 438,00 m²**

Sum of variation tents area

2016-05-22 & 2016-06-17 evolution**↑ 12 250,00 m²**

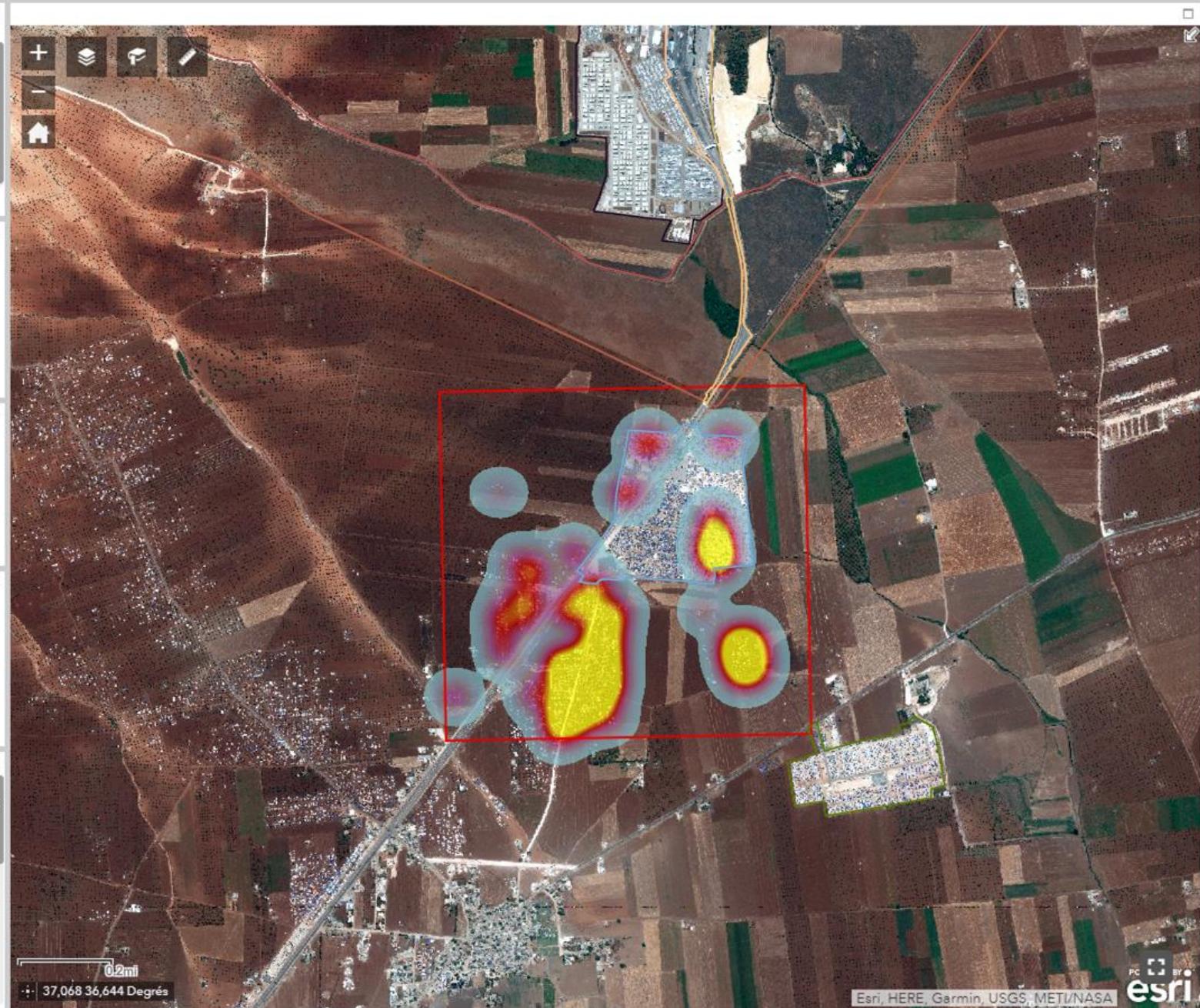
Légende

oncupinar_implantation_tent_2016_04

Elevé

Faible

Faible



Business models

Cloud SaaS platform

- Web access via Earthcube platform
- Site catalogue
- Commercial Data

On premise deployment

- Local implementation
- Classified imagery
- Training/maintenance
- Can be plugged to legacy GIS

Technology « bricks »

- Integration of detectors and/or tools
- Interface with partners (ESRI,Marklogic,Thales)



Evolutivity

Security &
customization

Autonomy

Apps

Site & conflict reports

Activity Based Intelligence
(anomaly detection, pattern of life)

Geodatabase

Objects

Human geography

Military geography

Detectors

Military activity
(aircrafts, ships,
vehicles...)

Logistics
(containers, stockpiles...)

Infrastructure
(buildings, roads...)

Platform

Tagging / QC

**Dataset &
training**

Processing

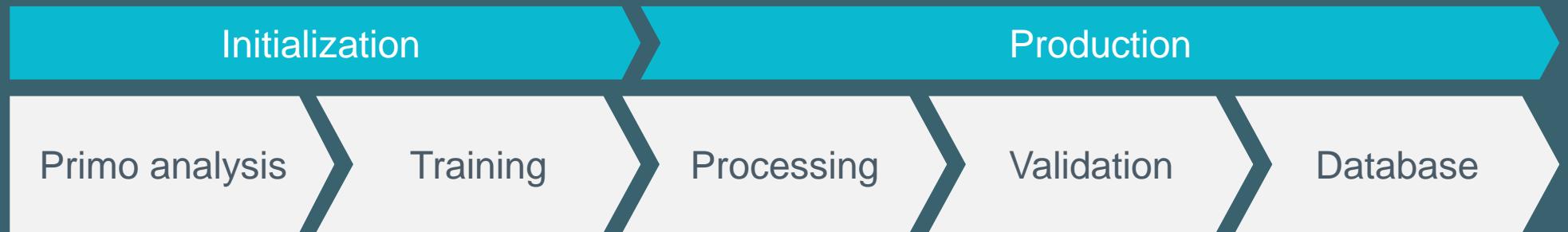
**Continuous
learning**

S-Cube

End user perspective

The infrastructure to get there

System overview



Primo analysis app

**STANAG 3596
based**

- Standardization
- Reduced error risk
- Time saving

**Standard GIS
tools**

- Productivity
- Direct database access

**Initialize
processes**

- Prewired alerts & detections per category
- Customizable at any time

Primo analysis

The screenshot shows the Earth Cube software interface. On the left, a vertical sidebar lists various administrative functions: Users, Create user, Manage users, Change user rights, Production, Import observables, Sites, Sites informations (which is highlighted in blue), Sub-area modifications, Dashboard, Configuration, Category management, Observable management, and Tags.

The main content area is titled "Areas". It features a "Create" button at the top left and an "Update" button at the top right. A sub-header "Pick an area to update" is present. There is a small cursor icon pointing towards the top left corner of the main content area.

Observable management

EARTH CUBE 

Users
Create user
Manage users
Change user rights

Production
Import observables

Sites
Sites informations
Sub-area modifications

Dashboard

Configuration
Category management

Observable management

Tags

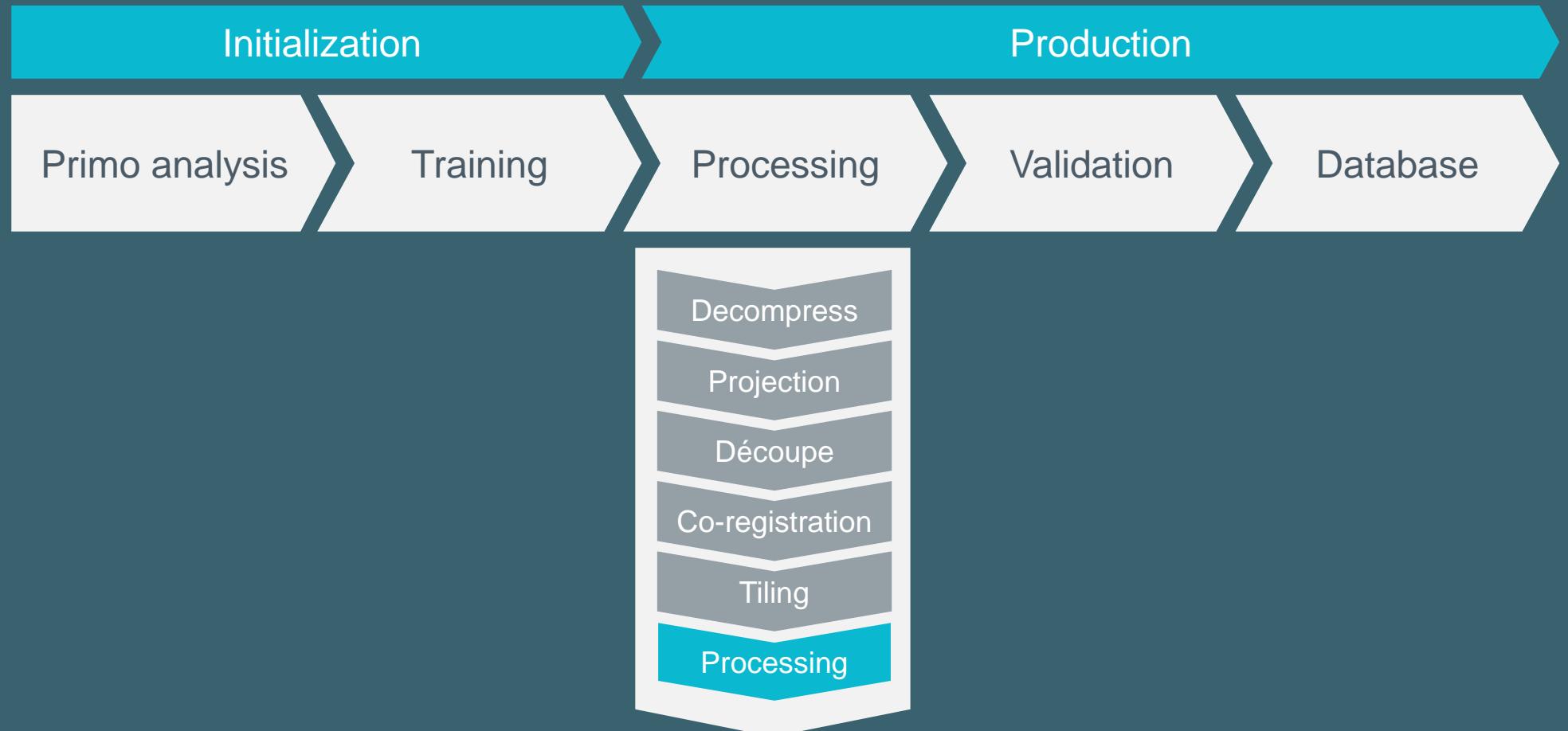
Categories
Create **Update**

Pick a category to update



Rechercher dans la page Tout surligner Respecter la casse Mots entiers X

Algorithm manager



Algorithm manager



| | Algorithms | Build datasets | Process area | Tile area | Adjust image | |
|------------------------|--------------|----------------|--------------|---|----------------|---|
| Users | | | | | | Add algorithm |
| Create user | Area | Observable | Mode | Segmenter img | Processor type | Classifier img |
| Manage users | khmeimim | aircraft | ms | ml-aircraft_dg_generic_ms:prod-latest | cpu | ml-classif_aircraft_dg_generic_ms:prod-latest |
| Change user rights | khmeimim | vehicle | ms | ml-vehicle_dg_generic_ms:prod-latest | gpu | Edit Delete |
| Production | mezzeh | helicopter | ms | ml-helicopter_dg_generic_ms:prod-latest | cpu | Edit Delete |
| Import observables | port0 | vessel | ms | ml-vessel_all_generic_ms:prod:0.0.4 | gpu | ml-classif_vessel_dg_port0_ms:prod-latest |
| Sites | bandar-abbas | vehicle | panchro | ml-vehicle_dg_generic_ms:prod-latest | gpu | Edit Delete |
| Sites informations | assab | vehicle | ms | ml-vehicle_dg_generic2_ms:prod-latest | gpu | Edit Delete |
| Sub-area modifications | bandar-abbas | vessel | ms | ml-vessel_dg_generic_ms:prod-latest | cpu | ml-classif_vessel_dg_bandar_ms:prod-latest |
| Dashboard | dingxin | vessel | ms | ml-vessel_dg_generic_ms:prod-latest | cpu | ml-classif_vessel_dg_generic_ms:prod-latest |
| Configuration | al-tanf | vehicle | ms | ml-vehicle_dg_generic2_ms:prod-latest | gpu | Edit Delete |
| Category management | istamo | vehicle | ms | ml-vehicle_dg_generic_ms:prod-latest | gpu | Edit Delete |
| Observable management | | | | | | |
| Tags | | | | | | |

Tagging application for quality check / labelling



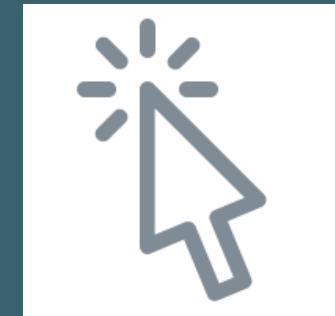
Web based platform

User friendly UI/UX
Standard GIS tools



Direct DB interface

All action logged
Versioning



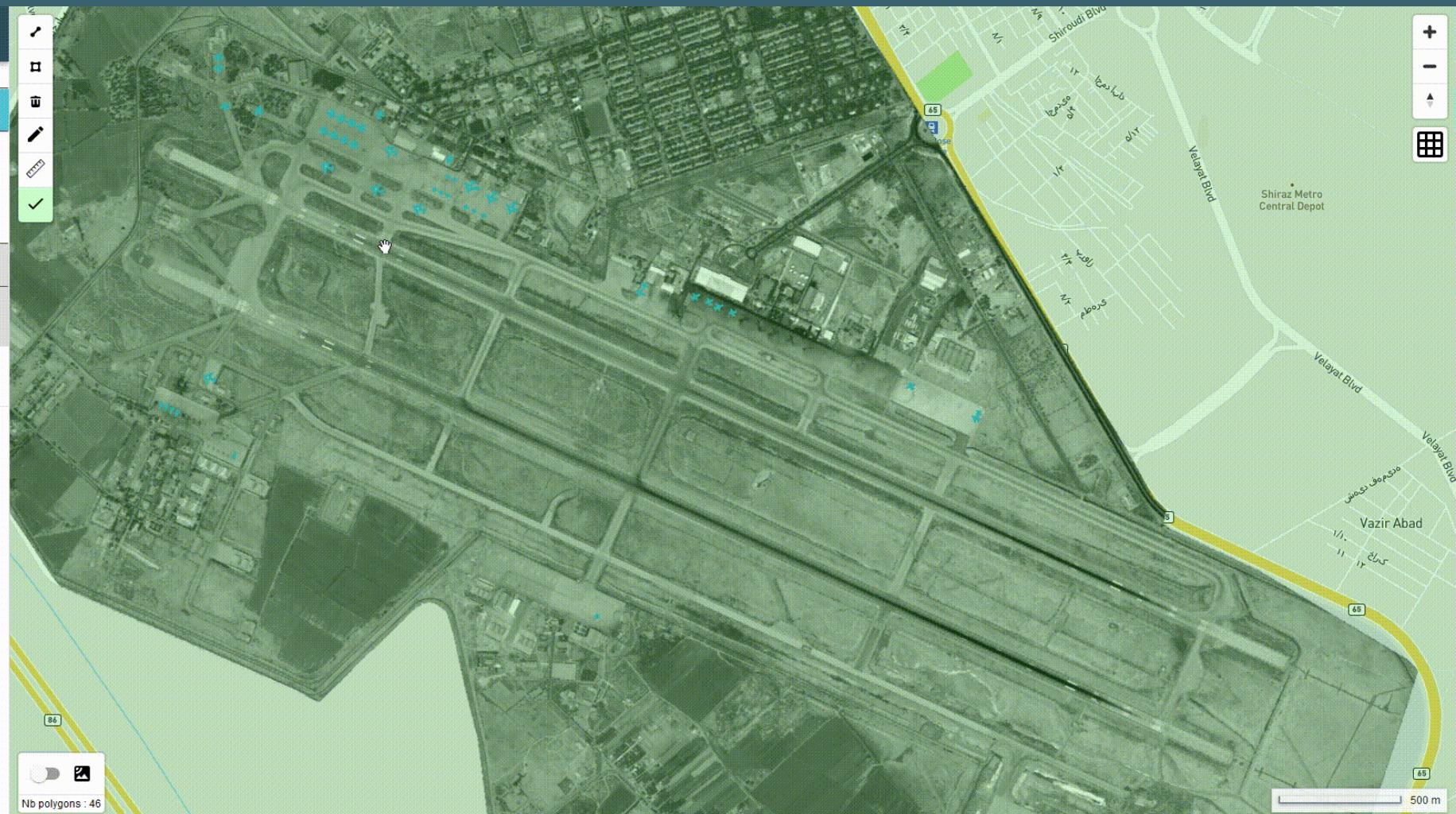
AI ready

Segmentation
Classification
Bbox

Quality check

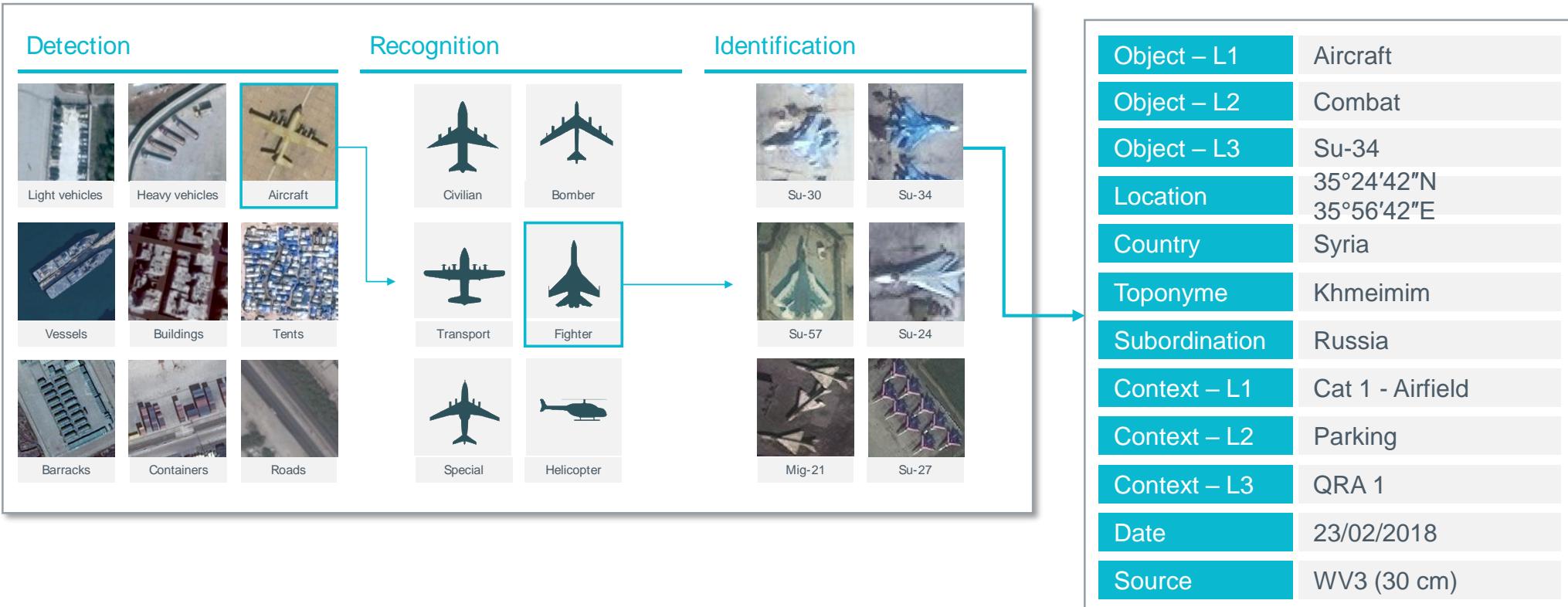


Classification



Database interface

From algorithm version to aircraft classification, everything is in DB!!!



Simple interface enable anomalies detection and predictive analytics capabilities

Conclusion

| Component | Function |
|-------------------|---------------------|
| Photo analyst app | Primo analysis |
| Tagging app | Annotation/QC |
| Dataset generator | Training set gen |
| DB interface | Predictive analytic |
| Process manager | Manage algorithm |
| AI framework | Training |
| Prod framework | Algo deploy & test |

All components are

- Autonomous
- Deployable on premise
- Containerized and self sufficient
- Customizable to client use cases

www.earthcube.eu

Merci