



EUROPEAN UNION
SATELLITE CENTRE

Analysis for decision making



Climate and Energy Security Initiatives at SatCen

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European Union Satellite Centre

SatCen supports the decision making and actions of the European Union in the field of **CFSP** by providing products and services resulting from the exploitation of relevant **space** assets and collateral data



EU Agency located in Madrid (Spain)



GEOINT Service Provider



Support to the EU Space Programme



Capability Development



Research, Technology Development and Innovation

The RTDI Unit works in 5 activity axes to identify, implement and validate state-of-the-art technologies and innovative solutions



New Data

- New Payloads
- HAPS and UAVs
- Collateral Data



Innovative Tech

- Big Data & AI
- Digital Platforms
- Digital Twins



EO Applications

- Change Detection
- Object Detection
- Monitoring Tools



EU Initiatives

- R&I Programmes
- GOVSATCOM
- IRIS²



New Security

- New Space
- Climate Security
- Transversal Domains



New Security

The geopolitical and social changes are expanding the demand of GEOINT services to address new complex security scenarios

Climate Security

Changes in climate patterns can introduce major risks in some regions as forced migration



Environmental Security

Illegal activities or unforeseen extreme weather events can threaten safety of population



Resource Scarcity

Water access or scarcity of food or raw materials can lead to conflicts



Energy Security

Energy management can be linked to stability, security and prosperity of States



Health Security

High level of contaminants or pandemics can affect daily life of citizens



Geopolitical Challenges

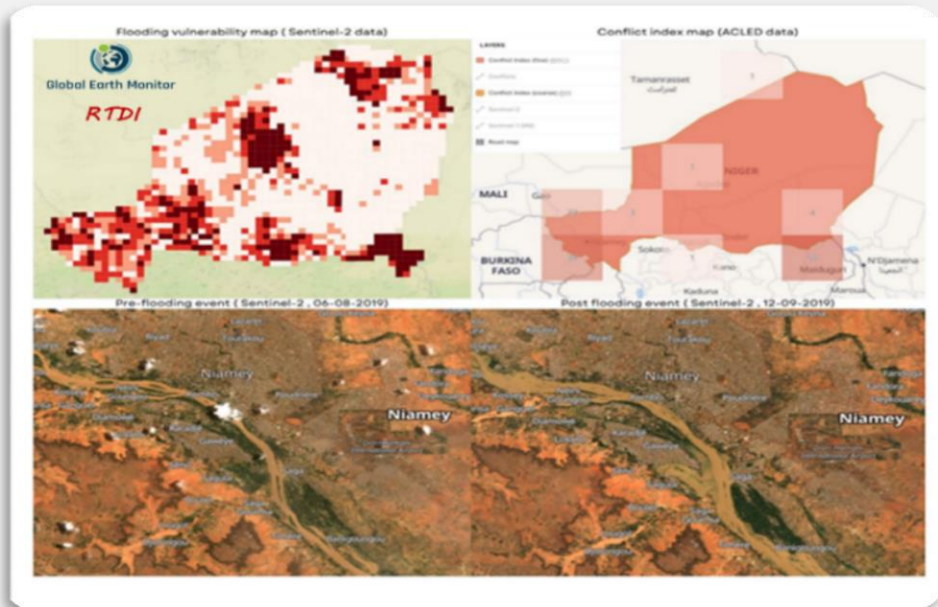
Conflicts in neighbor countries can drive to societal instability in the EU



Examples of Climate / Energy Security Projects at SatCen (I)

Climate Security Dashboard

Linking climate change effects with conflict dynamics exploiting EO and collateral data sources



Integration of climate vulnerability, conflicts and EO data in GEM Conflict Pre-Warning pilot (© SatCen)

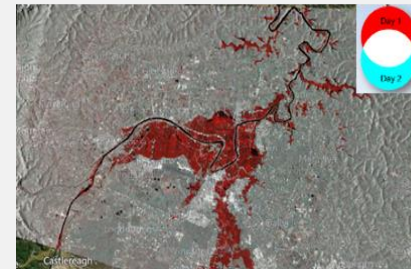


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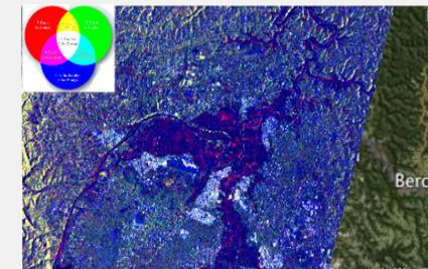
Flood risk & impact assessment

e-shape ensures the optimal implementation of EO-based applications in support to the European contribution to GEO

S1 ACD composite



S1 MTC composite



S2 change map

FRIEND dashboard: a smart organization of the heterogeneous relevant datasets that facilitates the analysis.



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Examples of Climate / Energy Security Projects at SatCen (II)

LSP#1: Cross-Border/Cross Domain Large Scale Pilot in Transport, Energy and Telecoms



Multimodal cross-country transport (port, rail and highway), energy (oil) and telecoms/ICT critical infrastructure and services in 4 countries

ATLANTIS

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Bridging Artificial Intelligence with Earth Observation world

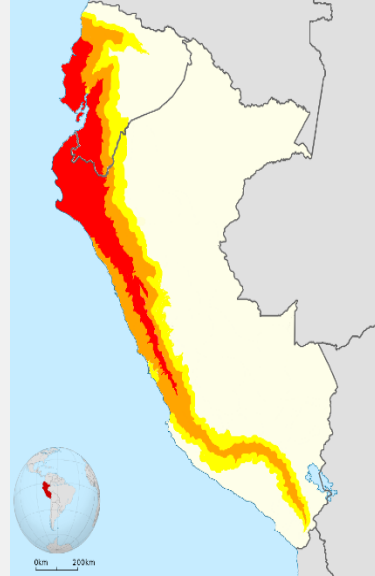


A series of 5 open calls are being implemented in domains of high economic and societal impact as Agriculture, Health, Energy and Security

Ai4 copernicus

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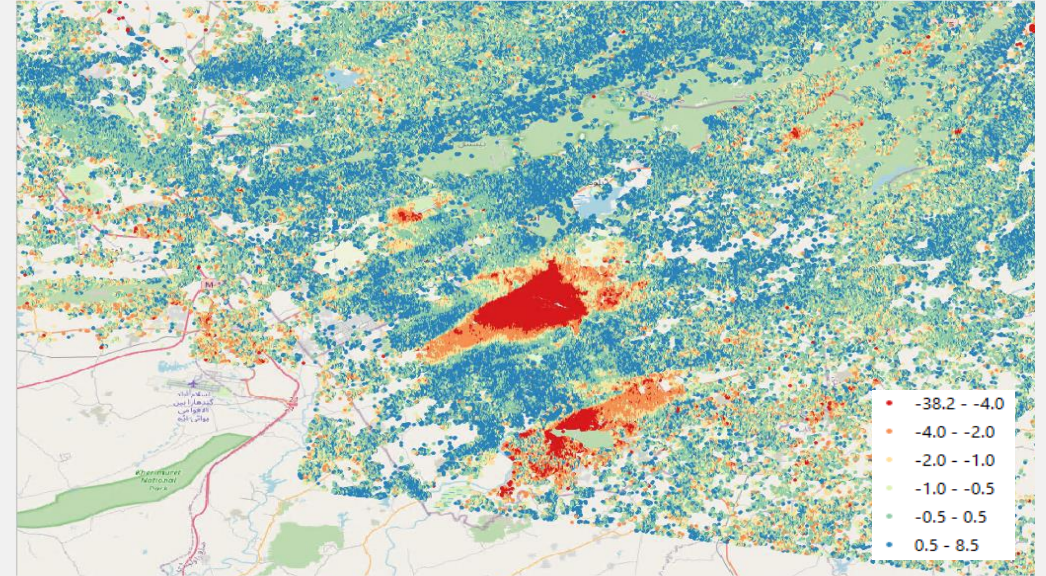
Examples of Climate / Energy Security Initiatives at SatCen



- 👁️ **Climate Security and Energy Sustainability**
- 📡 Sentinel-1 and Sentinel-2 data, meteo data, extreme events database, other ESA EO satellites data
- ⚙️ Long time series analysis
- 📍 Peru (used as initial example)



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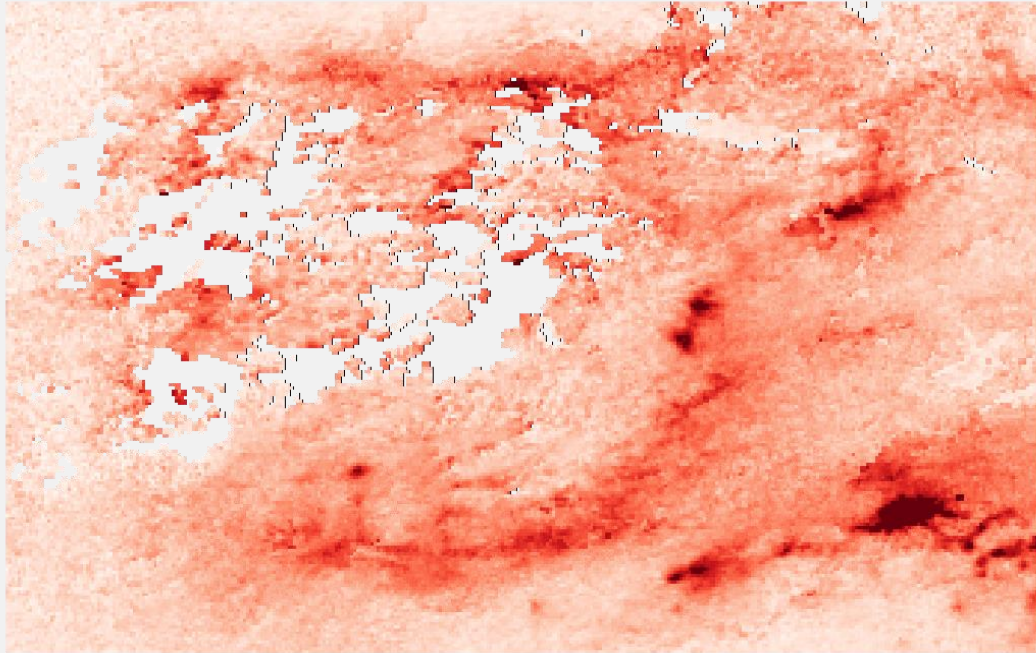


- 👁️ **Assessment on impact of underground water extraction**
- 📡 Long time series of Sentinel-1 SLC
- ⚙️ SBAS technique and thematic analysis
- 📍 Islamabad-Rawalpindi (Pakistan), 2016-2022



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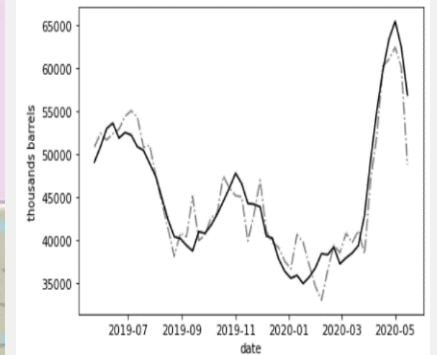
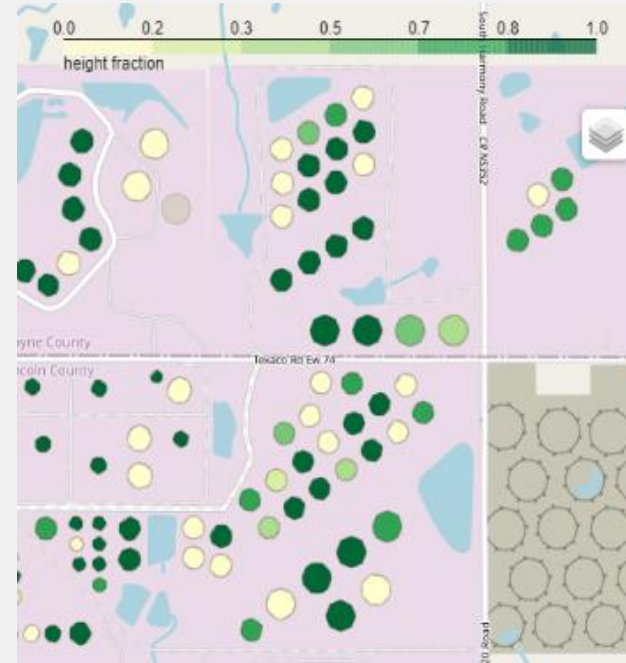
Examples of Climate / Energy Security Internal Activities at SatCen



- 👁️ **Monitoring of NO2 concentration over Spain**
- 📡 Sentinel-5P
- ⚙️ Time series
- 📍 Spain, March-June 2020



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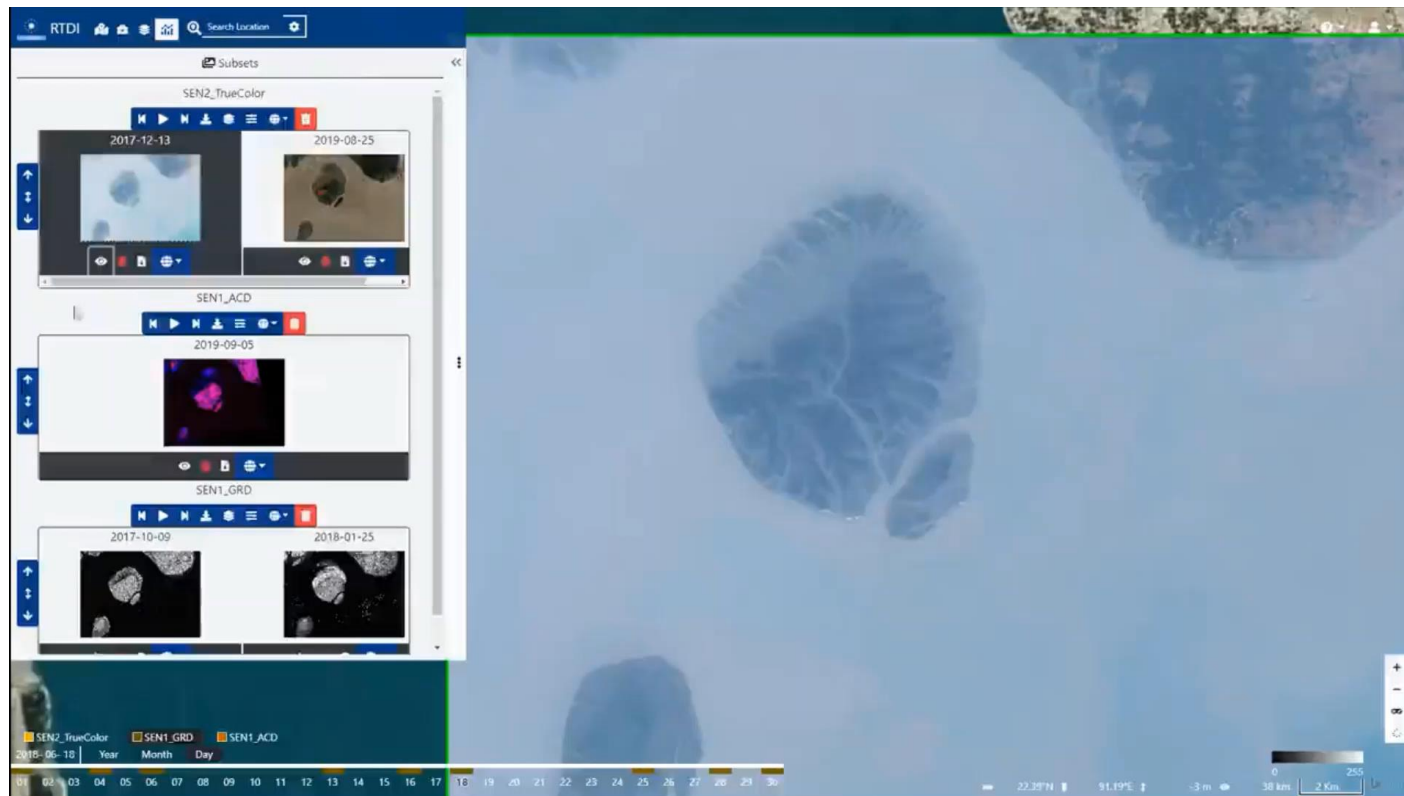
- 👁️ **Monitoring of oil tank levels to estimate demand**
- 📡 Sentinel-1 SLC
- ⚙️ Model based on exploiting changes in backscatter
- 📍 Cushing, OK (US), June 2019 - June 2020



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GEO-DAMP

Suitable R&I outcomes are integrated into the GEOspatial Data Management Platform to transfer knowledge and results to SatCen daily activities



Share Knowledge

Access Heterogeneous Data

Evaluate Innovative Technologies

Develop New Algorithms

Sustain R&I Outcomes

Demonstrate Results

Deploy Operational Services

GEO-DAMP can be considered a building block of the future **SatCen Digital Platform** and a prototype of a **Digital Twin Earth for Security**

Conclusions

1

SatCen supports EU MS and EU decision-makers with the provision of geospatial intelligence services and products

2

New Security scenarios are calling for innovative solutions to exploit EO data more efficiently

3

SatCen works in research and innovation activities cooperating in key projects and initiatives to address Climate and Energy Security challenges

4

Continuous R&I and cooperation, both internally and externally, are essential to guarantee successful investment and results

Thank you!



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