Global Earth Monitor

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Exploitation of EO data

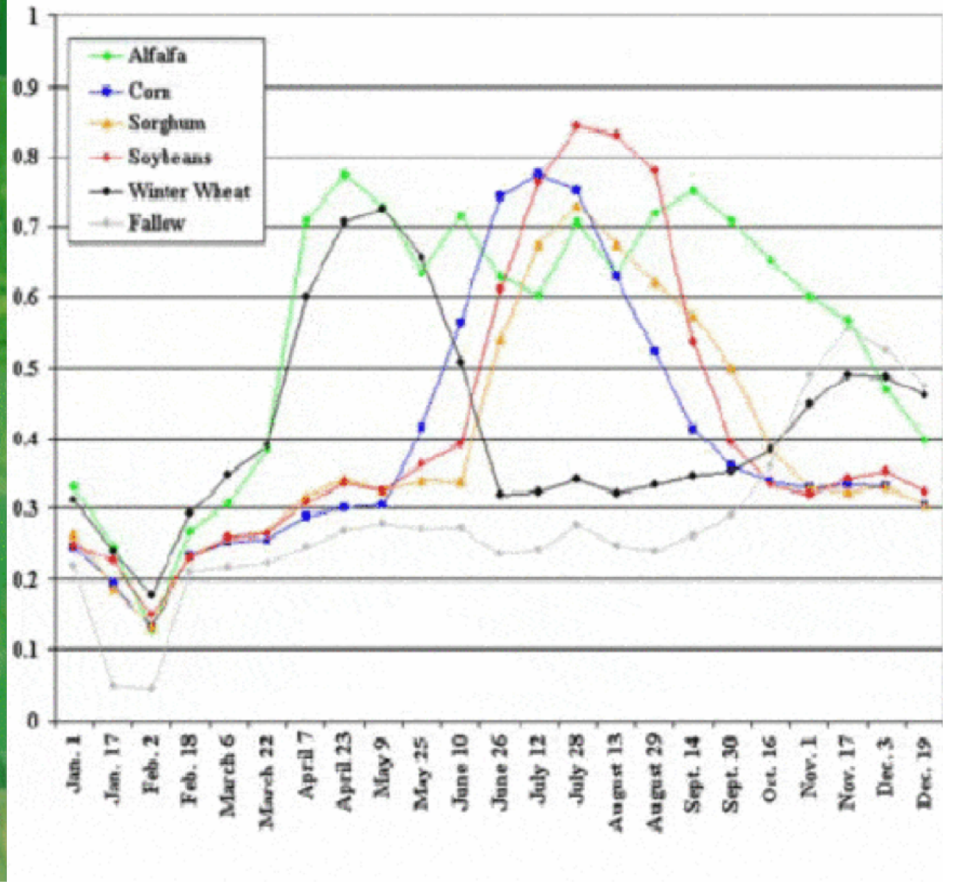
- Process vast amounts of satellite imagery
- Establish ML modelling with EO data
- Do it at scale

Objective

Economically viable continuous monitoring of the Earth

- Real-world scenarios
- Repeatable
- Reusable
- Scalable
- Cost-efficient


2016-05-03
500 m
Copernicus
SENTINEL Hub


Alfalfa
Corn
Sorghum
Soybeans
Winter Wheat
Fallow
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
Jan. 1
Jan. 17
Feb. 2
Feb. 18
March 6
March 22
April 7
April 23
May 9
May 25
June 10
June 26
July 12
July 28
August 13
August 29
Sept. 14
Sept. 30
Oct. 16
Nov. 1
Nov. 17
Dec. 3
Dec. 19


2016-05-03
500 m
Copernicus
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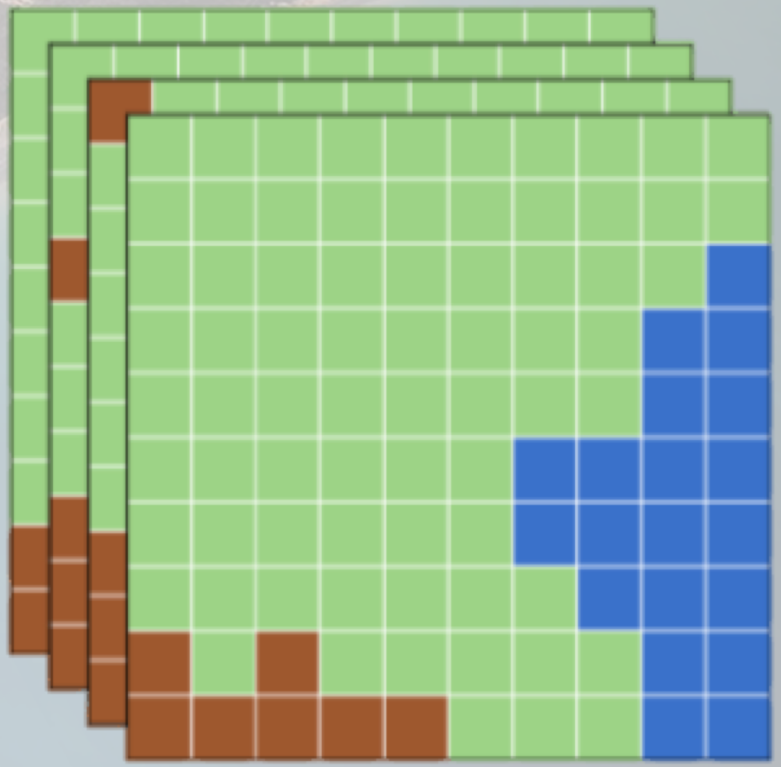
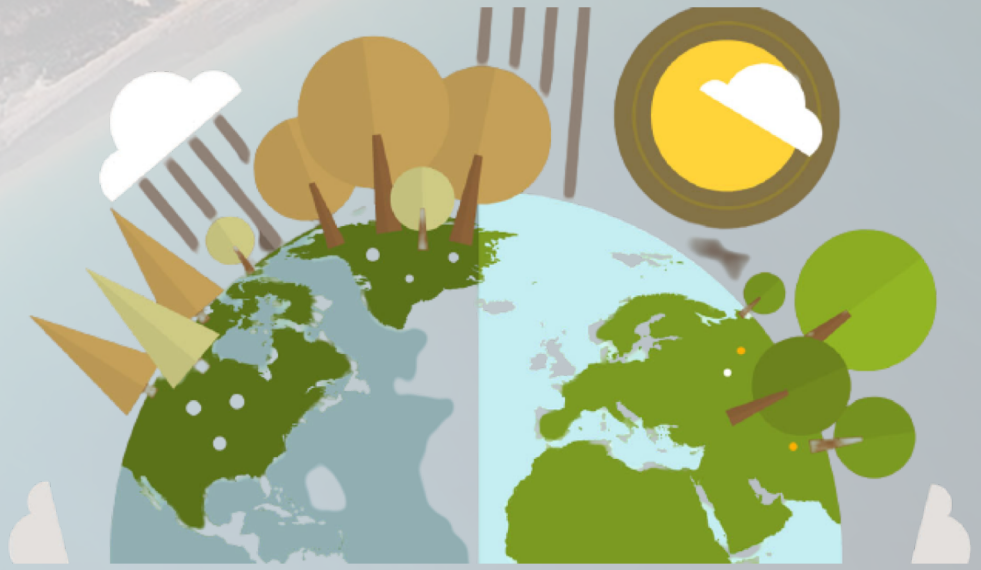
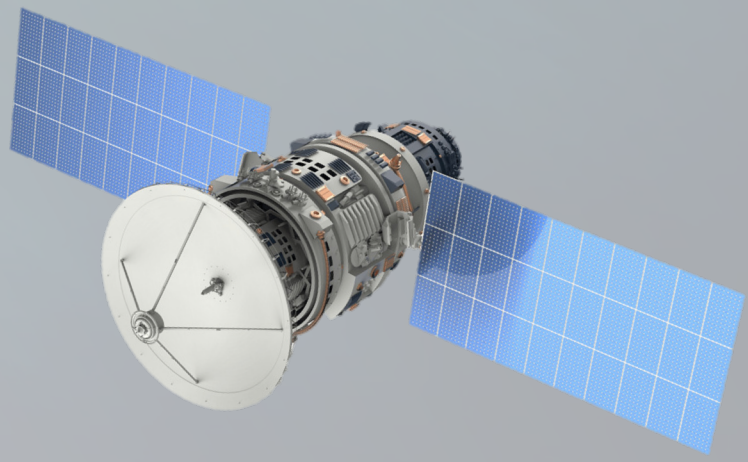
?

Cross-scale modelling



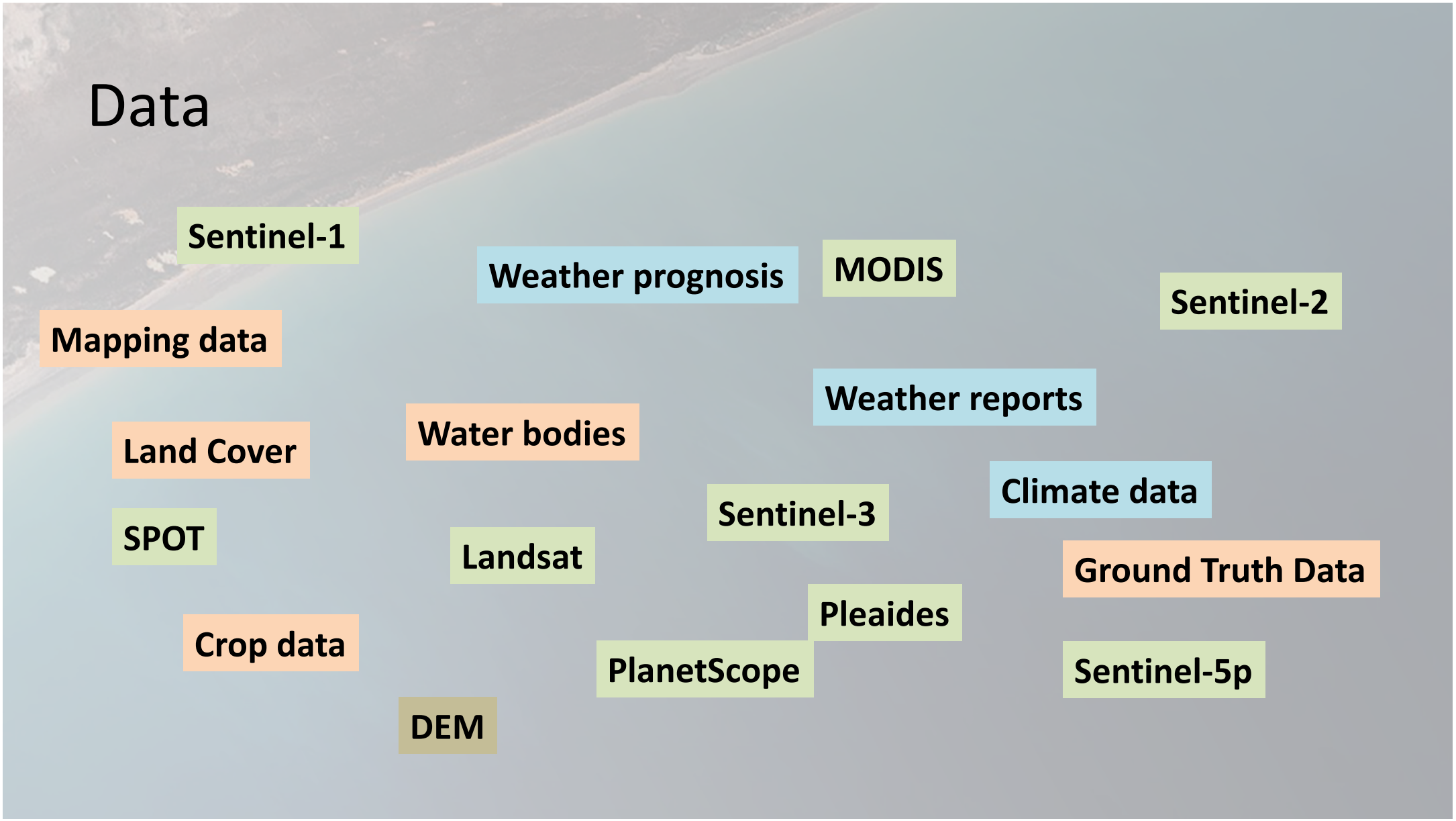
Weather/climate and satellite data





Big Data	Satellite data	ML
Weather	Big Data	ML
ML	Satellite data	Big Data
Mapping	ML	Big Data
Satellite data	Mapping	ML

Data


Sentinel-1
Weather prognosis
MODIS
Sentinel-2
Mapping data
Weather reports
Water bodies
Land Cover
Climate data
Sentinel-3
SPOT
Landsat
Ground Truth Data
Pleaides
Crop data
PlanetScope
Sentinel-5p
DEM

Machine learning methods

Long short-term memory

Time-series

Sub-resolution

Incremental Learning

Object-based

Multi-Task and Multi-Objective Learning

Feature attribution and Uncertainty Estimation

Causality modelling with Recurrent Network Architectures

Recurrent neural networks

Pixel-based

Meta-Learning for different Spatial (Temporal, and Spectral) resolutions

Super-resolution

Large scale processing

Analysis Ready Data

Static data cubes

Continuous monitoring

Data fusion

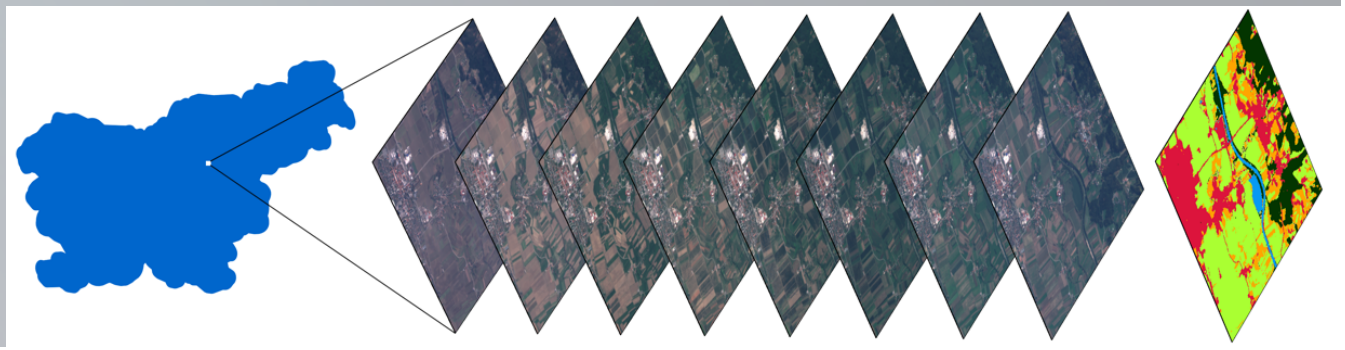
Scheduling

Dynamic data cubes

Parallel processing

Continuous land cover monitoring

- Change detection
- Map-ready
- Integration of various sources
- Repeatable
- Cost efficient
- Global scale



Crop identification

- Satellite and weather data
- Integration of expert knowledge
- Crop rotation
- Automated phenological stage prediction
- Global scale

Built-up area

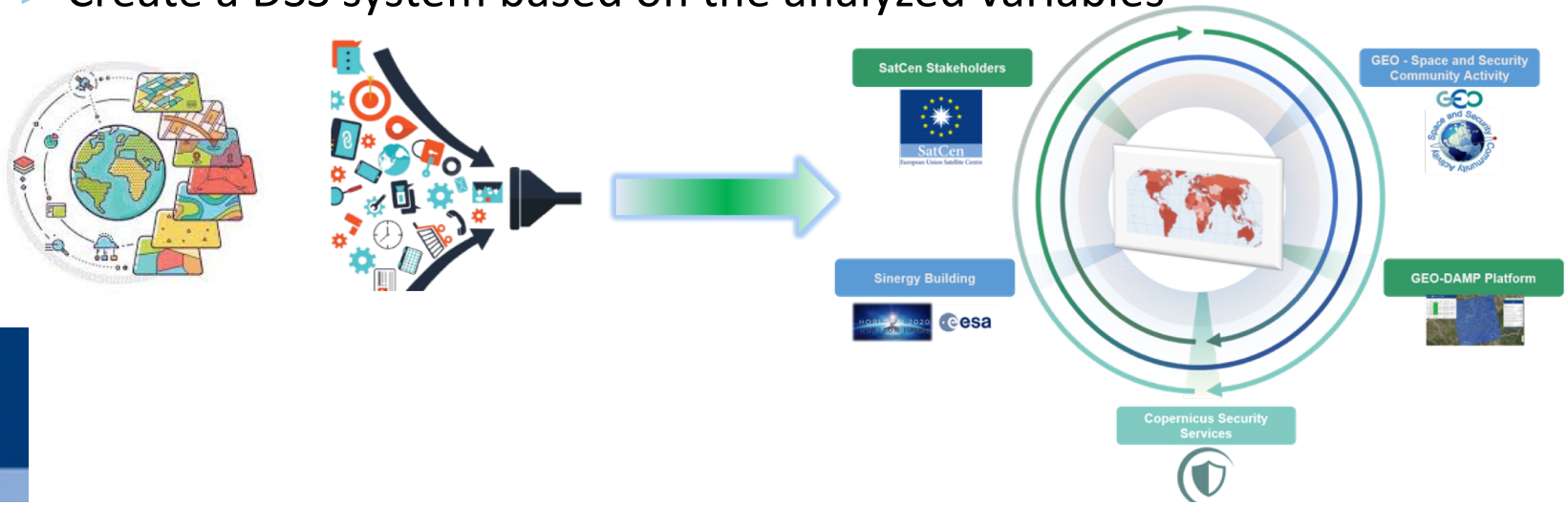
- Multi-resolution
- Data fusion
- On-going monitoring



Conflict Pre-Warning Map

The SatCen pilot will explore the **Climate-Security** nexus, correlating global climate changes and environmental issues with human activity behaviors, in support to guaranteeing the security of citizens:

- Explore the data lake related to space, security and climate
- Integrate the different data sources
- Create a DSS system based on the analyzed variables



SatCen

What is it for the community?

- Open-source results
- Ready-to-be-used examples
- Validation datasets

- Operational services
- Products

More information

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