



# Netherlands Space Office

Space for Climate Adaptation and Food Security

Kathelijne Beenen – AI4Copernicus – 25th May 2023

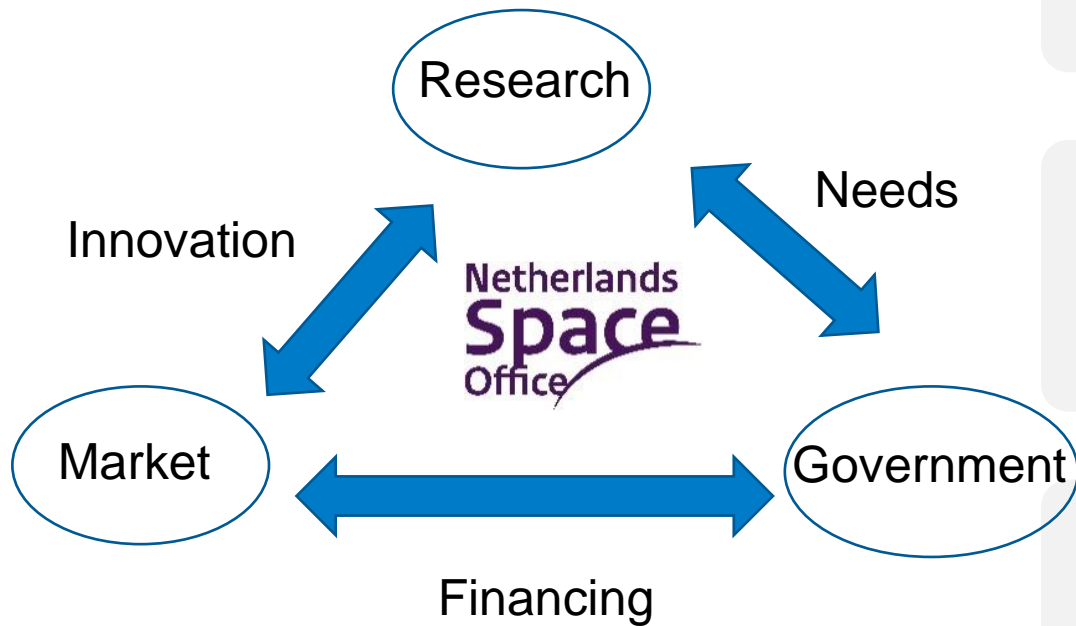


# Netherlands Space Office

- **Space agency of the Dutch government**
- **Task: implement the Dutch space policy**
- **Representation NL: e.g. ESA, EC, EUSPA**
- **Technology: stimulating the Dutch space industry**
- **Applications: stimulating the use of satellite data**
  
- **Roles: advice, support, facilitate and connect**



# Role of NSO



Advise (e.g. at finding, purchasing and implementation)



NL: Facilitate data through satellietdataportaal  
Global: Assisting in access to global databases



Support in innovative procurements





# NSO Steering committee:

- **Ministries:**
  - **Economic Affairs and Climate**
  - **Education, Culture and Science**
  - **Infrastructure and Watermanagement**
- **NWO (Dutch Research Council)**

(Ministry of  
Foreign Affairs,  
Ministry of  
Defence)

**NSO-office**  
**~30 fte**



# Stimulate Satellite Applications on a Global Level







# General

Since 2013, the **Geodata for Agriculture and Water (G4AW)** program has improved food security in developing countries by promoting the creation of digital advisory services based on the use of satellite data.

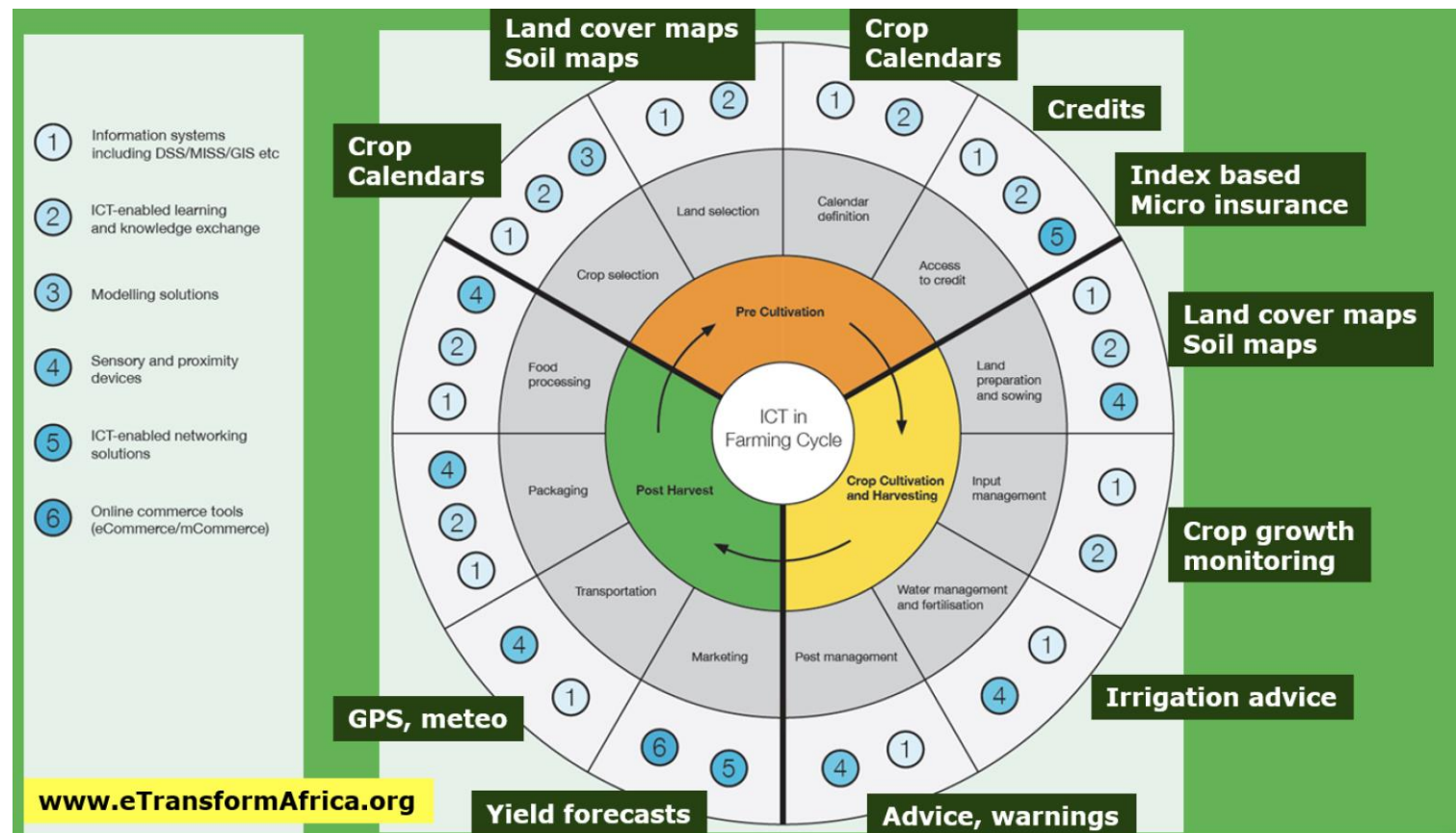
## Objectives:

- Reach 4.5 million smallholder food producers
- Efficient/decreased use of inputs
- Secure/increased production
- Secure/higher incomes





# Use of Earth Observation, weather data, and geodata for agriculture





15 Countries  
25 Partnerships

- Satellite data/service providers
- NGO's
- Public organisations
- Private (agricultural) sector
- Farmer cooperatives





## Achievements

- Support co-developing new (digital) market
- 30+ million private investment
- Digital advisory and/or financial services based on use of satellite and geodata
- About 50% of developed services are continued after project closure
- Geo-ict in strategies of Dutch NGO's & finance institutions
- Training and coaching of extension officers
- Stimulate local employment
- Awareness & outreach for new investments

### NUMBER OF FOOD PRODUCERS

4,051,800

Participating and trained in using G4AW services



30%

Female users



43%

Young (<35y) users

1,970,400

With improved livelihoods

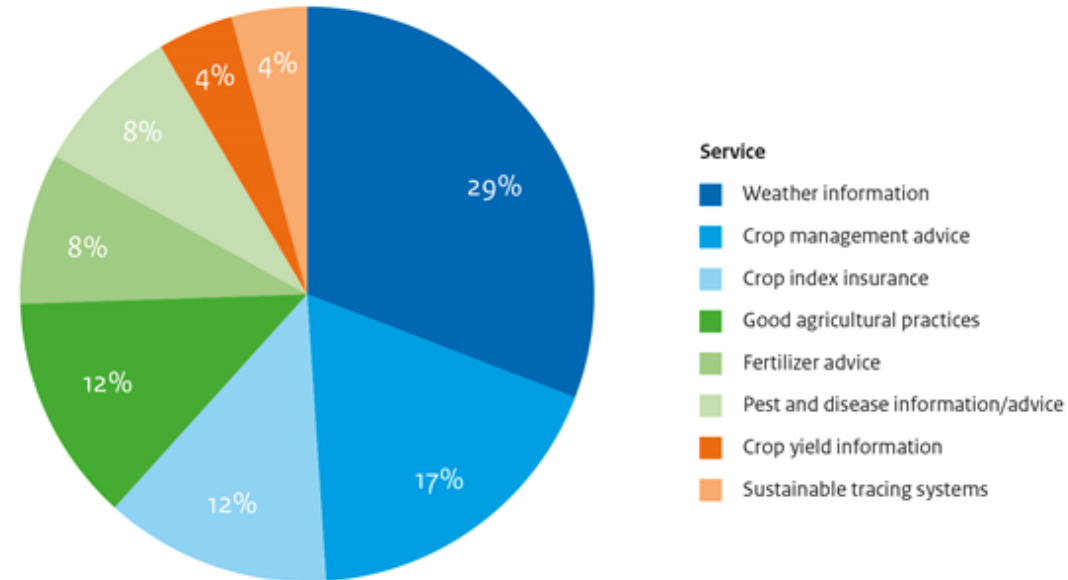
Contributing to:





## Examples of agtech/fintech services in G4AW

- More localized weather forecasts
- Yield forecasts / growth stages
- Pest & disease warnings
- Drought and flood warnings
- Index insurance
- Risk profiling supporting insurance and credits







## Satellite & Geodata

- Weather satellites (EUMETSAT, NOAA, a.o.)
- Satellite data (see right)
- Field plots (GNSS: GPS, GALILEO)
- In-situ data (GIS)
- Market information (GIS)

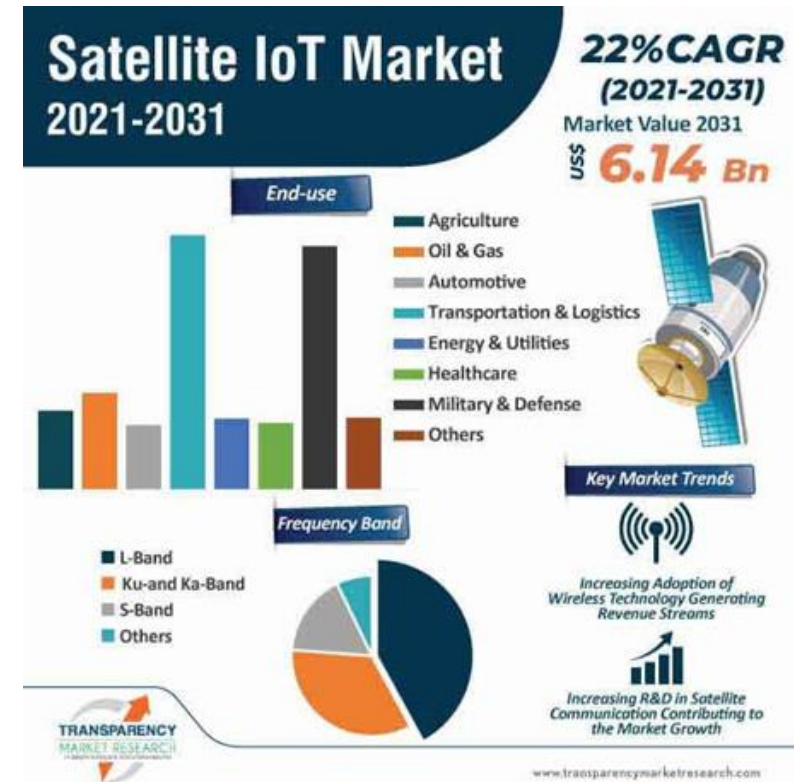
Supported by data platforms

Sensor type	Sensor name	Number in proposal	Number in operational service
<i>Optical</i>	MODIS	16	12
<i>Optical</i>	Landsat 7/8	14	5
<i>Radar</i>	Sentinel 1	14	11
<i>Optical</i>	Sentinel 2	14	14
<i>Optical</i>	SPOT-VGT / PROBA-V	4	2
<i>Optical</i>	VHR	4	3
<i>Radar</i>	SMAP	3	2
<i>Radar</i>	TerraSAR-X	3	1
<i>Radar</i>	ALOS PALSAR	2	-
<i>Radar</i>	AMSR	2	2
<i>Various</i>	Sentinel 3	2	-
<i>Radar</i>	SMOS	2	2
<i>Optical</i>	VIIRS	2	1



## Future developments/benefits

- Digital services are useful from BoP (more inclusive) to commercial farmers (paying clients)
- Digital services can be bundled to fit food producer needs (better)
- Digital services are beneficial for all value chain actors (also for logistics)
- New (space) innovations may emerge (IoT, SatCom in rural areas with no good connectivity) for farmers, access to finance and logistics







### Services:

Routing of herds  
(avoiding agri zones)  
Market information

### Channels:

Call center (Orange)

### Results:

STAMP (2019):  
>75k pastoralists  
MODHEM (2020):  
>65k pastoralists

### 2019-2022:

Scale up in Mali & BF  
Scaling to Niger

**SNV**



Hoefsloot  
Spatial  
Solutions

## Impact STAMP

Lower mortality rates for cows (23.9%)

Less herd loss: 160 euro (saving)



STAMP (Mali) / MODHEM (Burkina Faso)



### Services:

Drought insurance (localized)

### Channels:

Local insurance companies  
Farmers cooperatives  
AIC, Planet Guarantee

### Results:

farmers insured  
67,000 (2018)

### 2019-2022:

Scaling up  
289,000 in Uganda (2021)  
Introduction in Togo,  
Mozambique

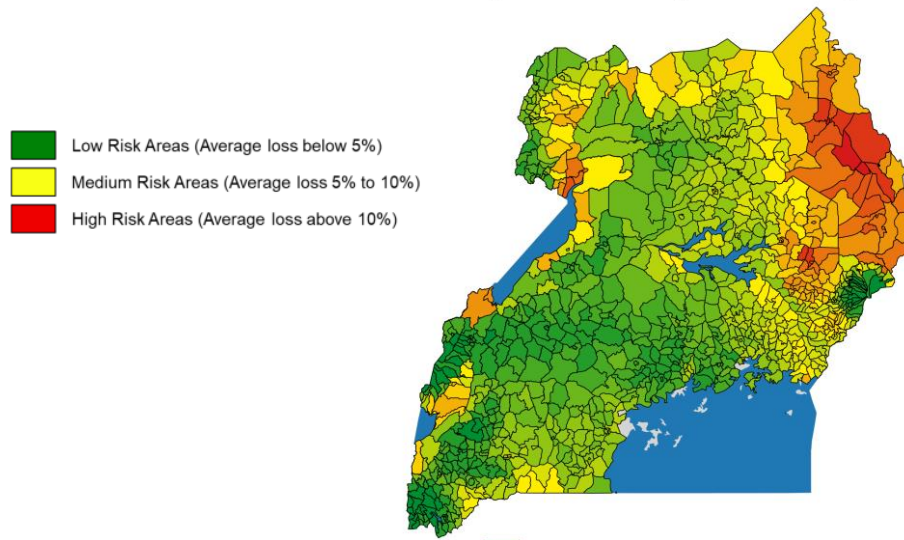
## Insured versus Uninsured

Less selling assets at distress before drought windows (4% / 21%)

Leaving farm for other work (4% / 15%)

Lower own consumption (16% / 35%)

Uganda Risk Rates (Generic Product)



# SumAfrica (Uganda, Mali)





### Services:

Crop growth monitoring  
Weather monitoring  
Phytophthora infestans (late blight) alerts  
Spray advice

### Channels:

SMS service

### Results:

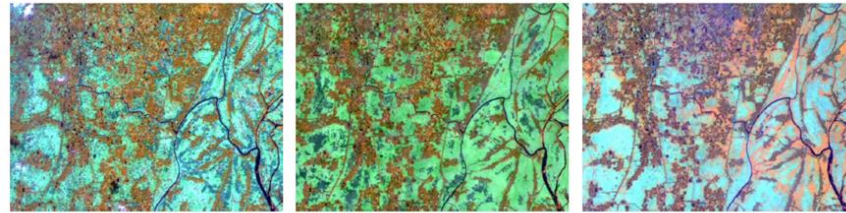
323.752 food producers with improved income

### 2020-2022:

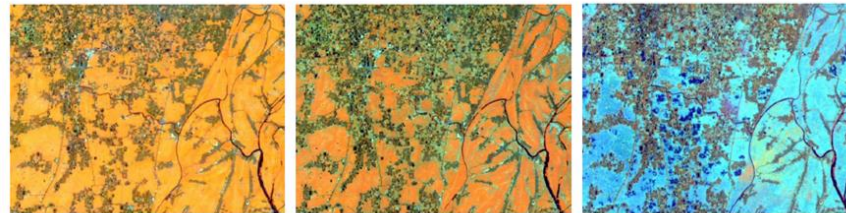
Scale up in Bangladesh  
Introduction in India

## Impact GEOPOTATO

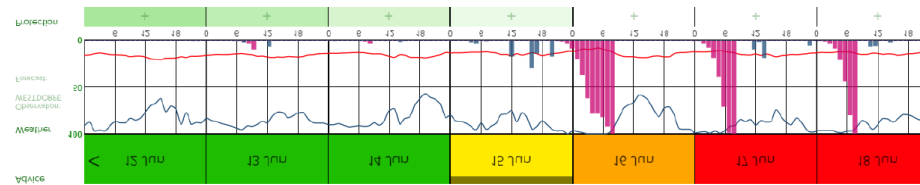
- 13% percent higher yield
- 173€/ha increase in income



November - Field preparation      December - Planting      January - Emergence

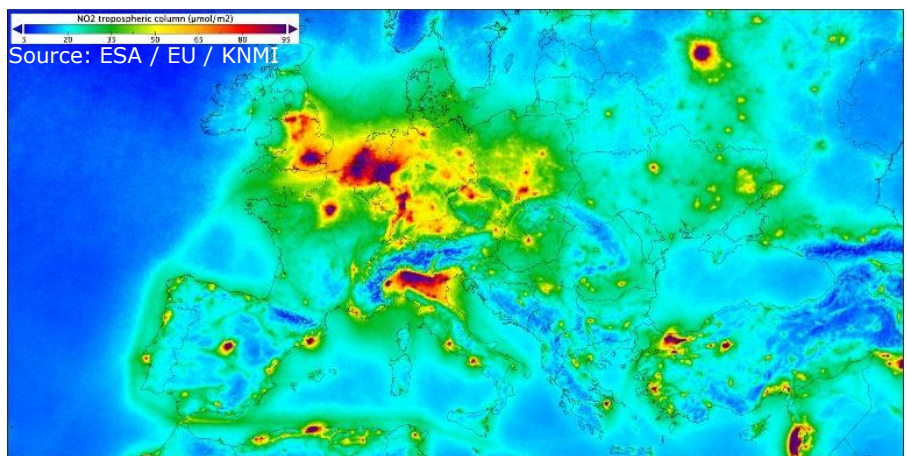


February - Full biomass      March - Hault senescence      March - Harvest



# GEOPOTATO (Bangladesh)

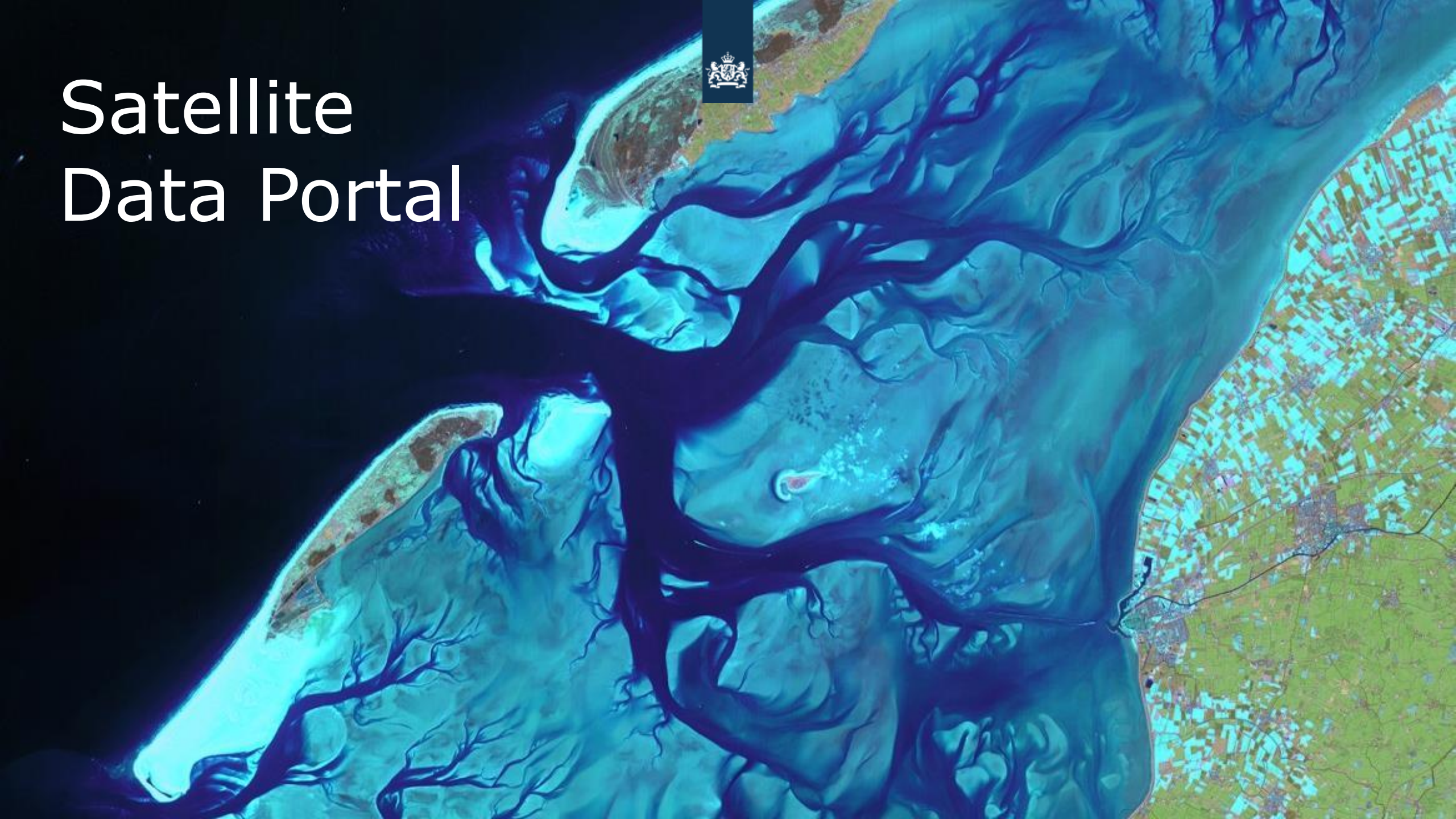




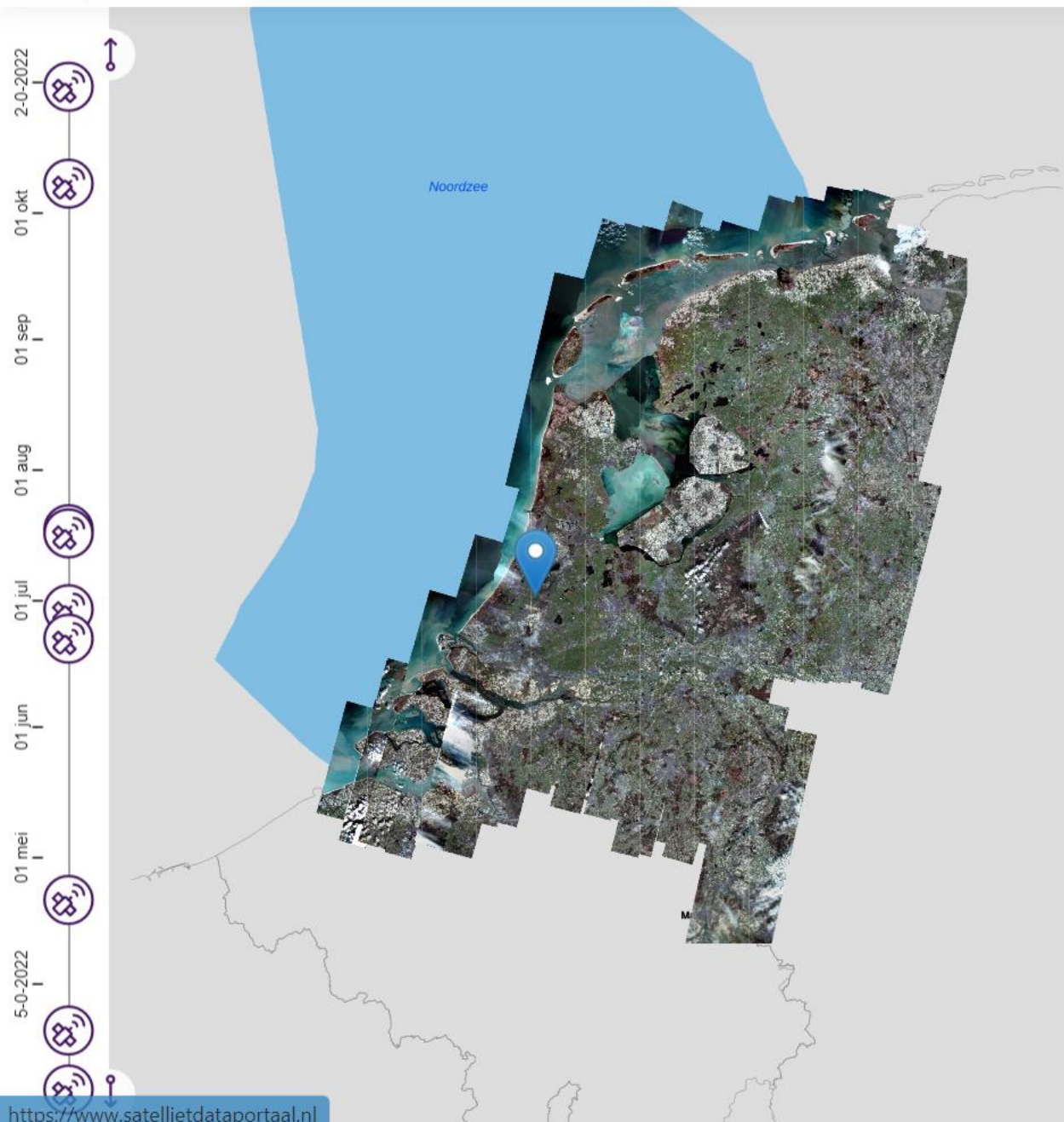
How to stimulate the use of satellite data applications on national level?



# Satellite Data Portal







- **Optical data:**
  - 6x per year, 30 cm resolution
  - **Pléiades NEO + SuperView NEO**
- **Radardata:**
  - 15 x per year, 5 m resolution
- **Only available in the Netherlands**

[www.satellietdataportaal.nl](https://www.satellietdataportaal.nl)



# Satellite Data Portal Timeline

## Optical data



## Radar data



## Portal



2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026



## Pléiades NEO

30 cm / 1,2 m

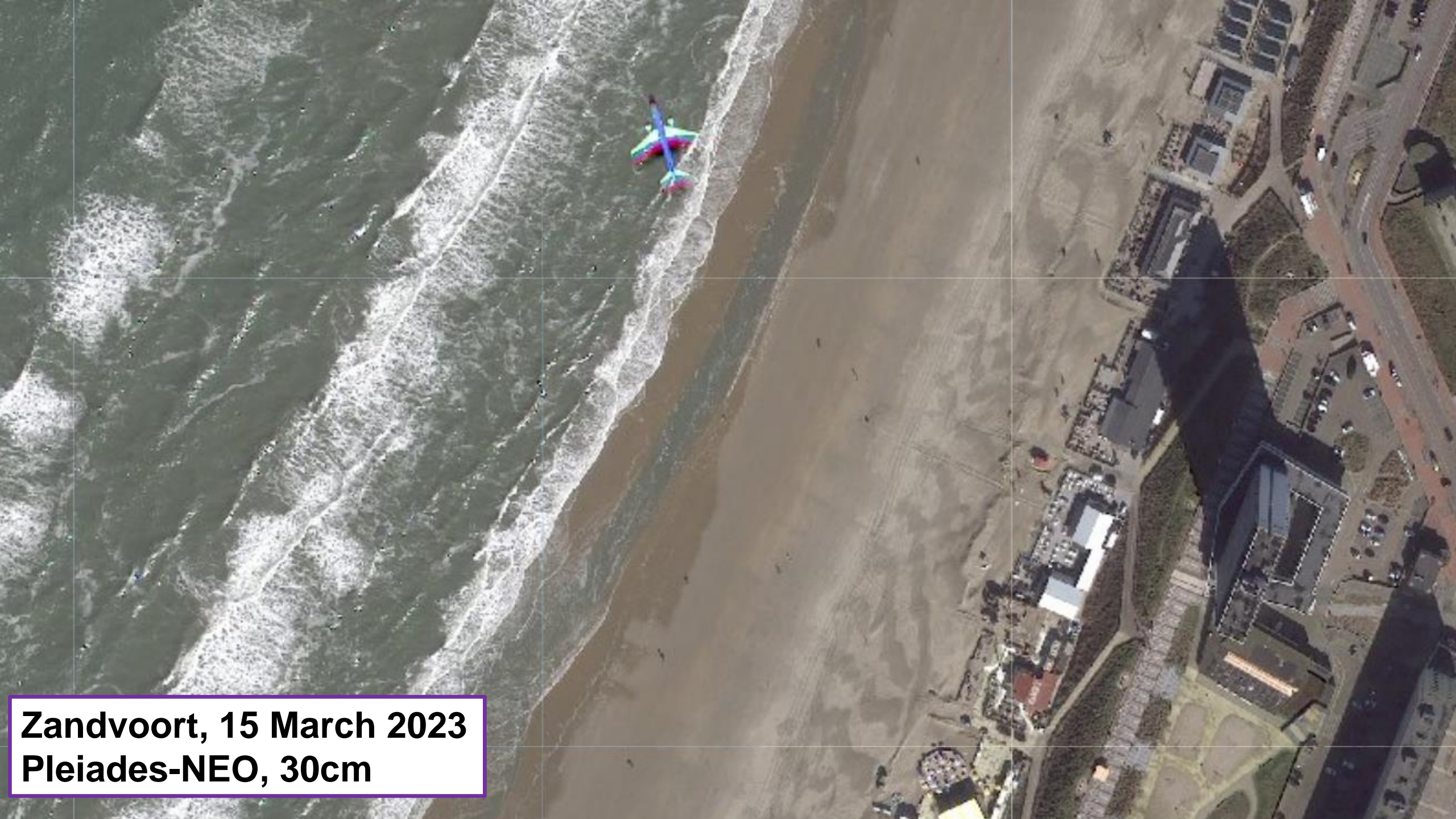
- PAN: 450 - 800 nm (Panchromatisch)
- B1: 400 - 450 nm (Deep Blue)
- B2: 450 - 520 nm (Blauw)
- B3: 530 - 590 nm (Groen)
- B4: 620 - 690 nm (Rood)
- B5: 700 - 750 nm (Red Edge)
- B6: 770 - 880 nm (NIR)

## SuperView NEO-1



- PAN: 450 - 890 nm (Panchromatisch)
- B1: 450 - 520 nm (Blauw)
- B2: 520 - 590 nm (Groen)
- B3: 630 - 690 nm (Rood)
- B4: 770 - 890 nm (NIR)





**Zandvoort, 15 March 2023**  
**Pleiades-NEO, 30cm**





# Climate adaptation- and mitigation



Flood warning system



Predicting solar energy



Monitoring carbon storage agroforestry



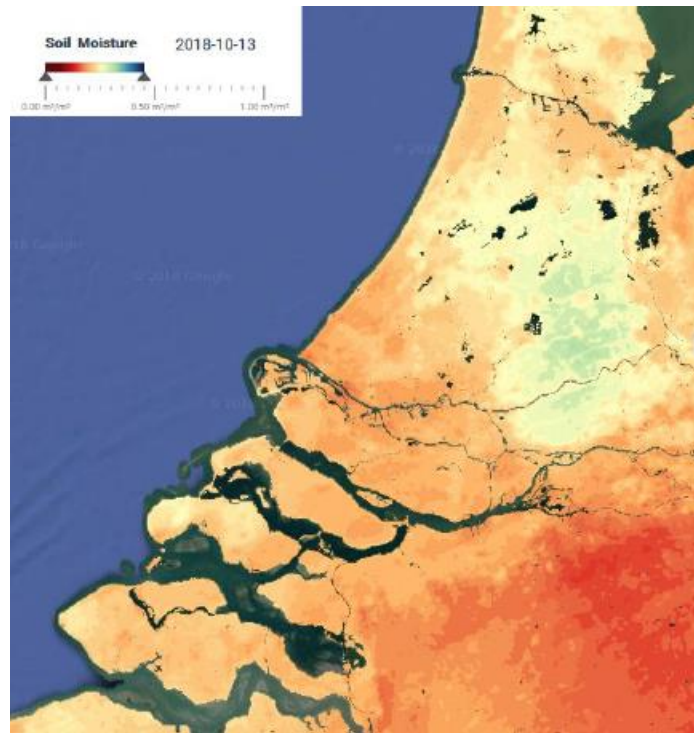
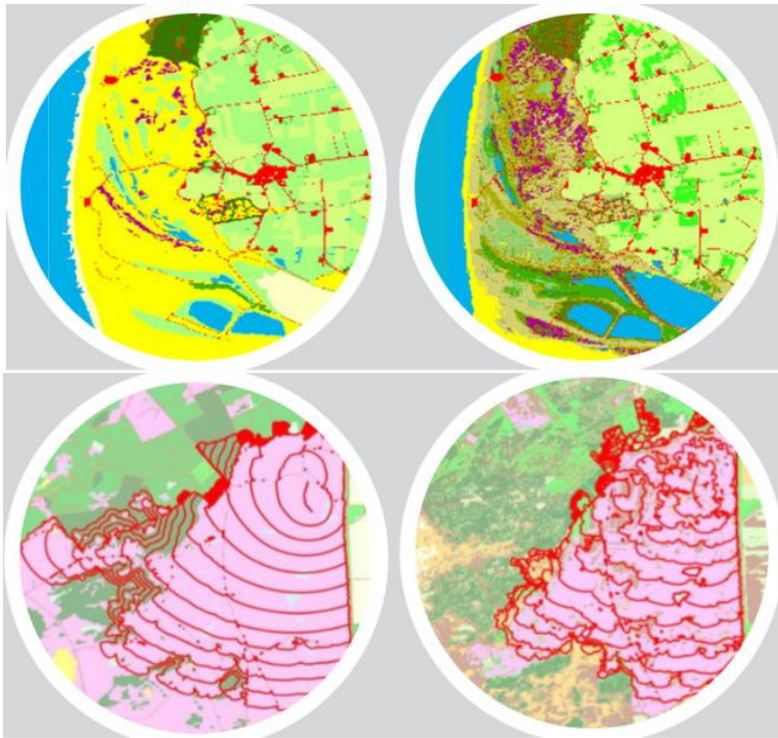
Mapping vulnerable trees



# Efficient fire service



Detailed, up-to-date vegetation map and regular drought monitoring ensure more efficient and effective fire service deployment







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**Thank you for your attention**

**Let's stay connected!**

Netherlands  
**Space**  
Office

