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HOW TO START YOUR OWN **REMOTE SENSING** COMPANY



BAD NEWS

You will fail



GOOD NEWS

Life is not fun without failure





INGREDIENTS

Satellite Data

Tools

Infrastructure

Trends



SMART FOREST & COMMODITY **ANALYTICS**

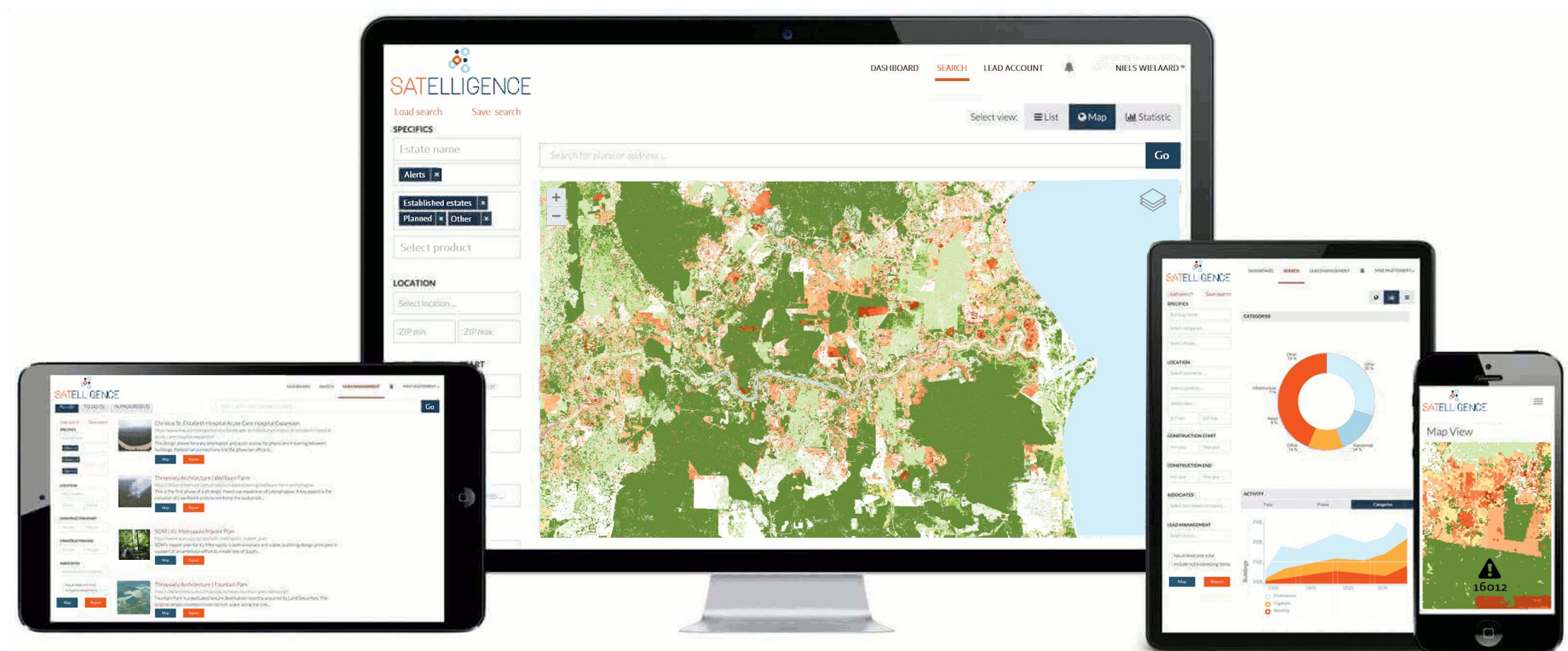


FOOD SECURITY

How to **feed** 2 billion more mouths
in 2030?



CONTINUOUSLY UPDATED COMMODITY MAP OF THE WORLD

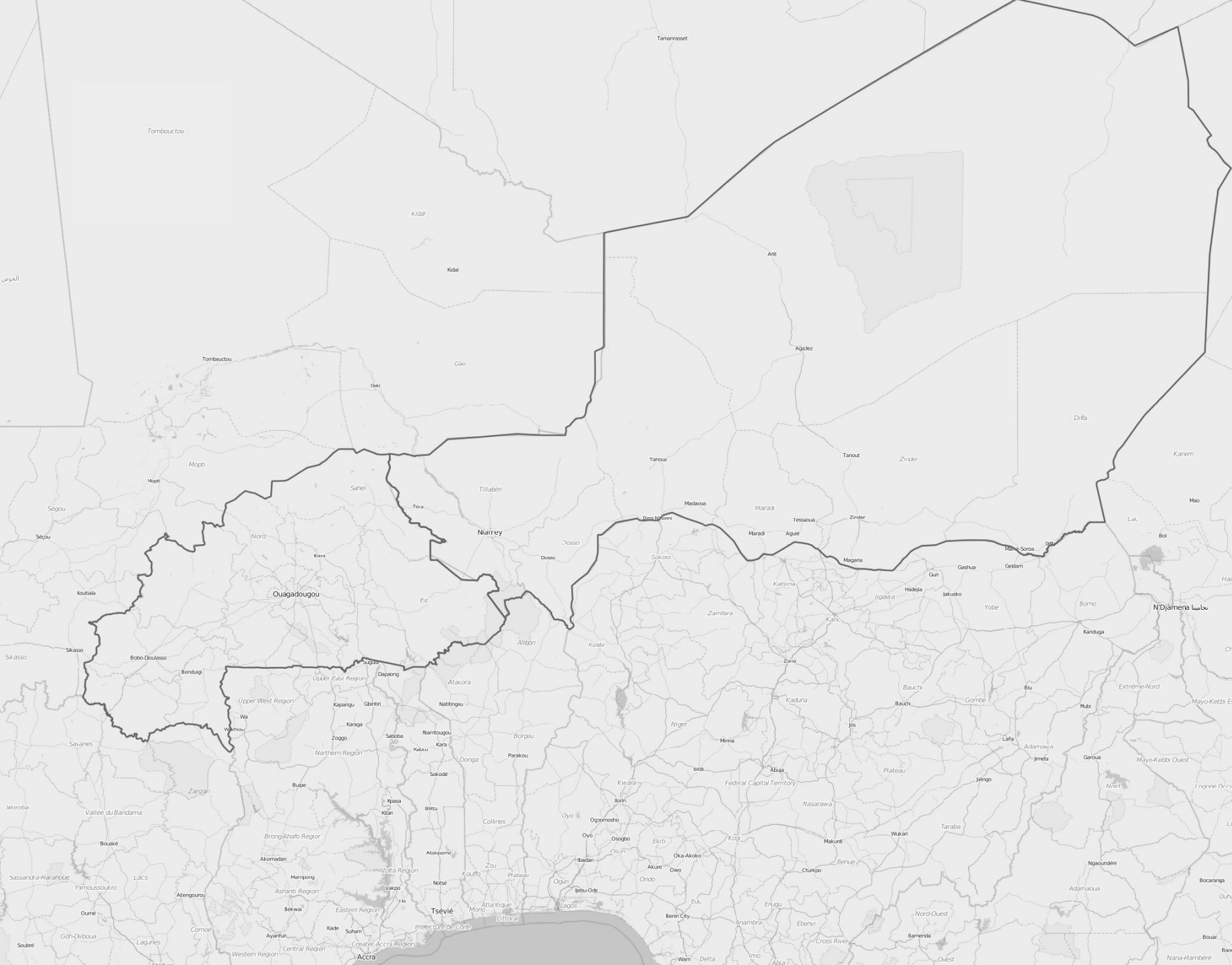




Burkina Faso

Niger

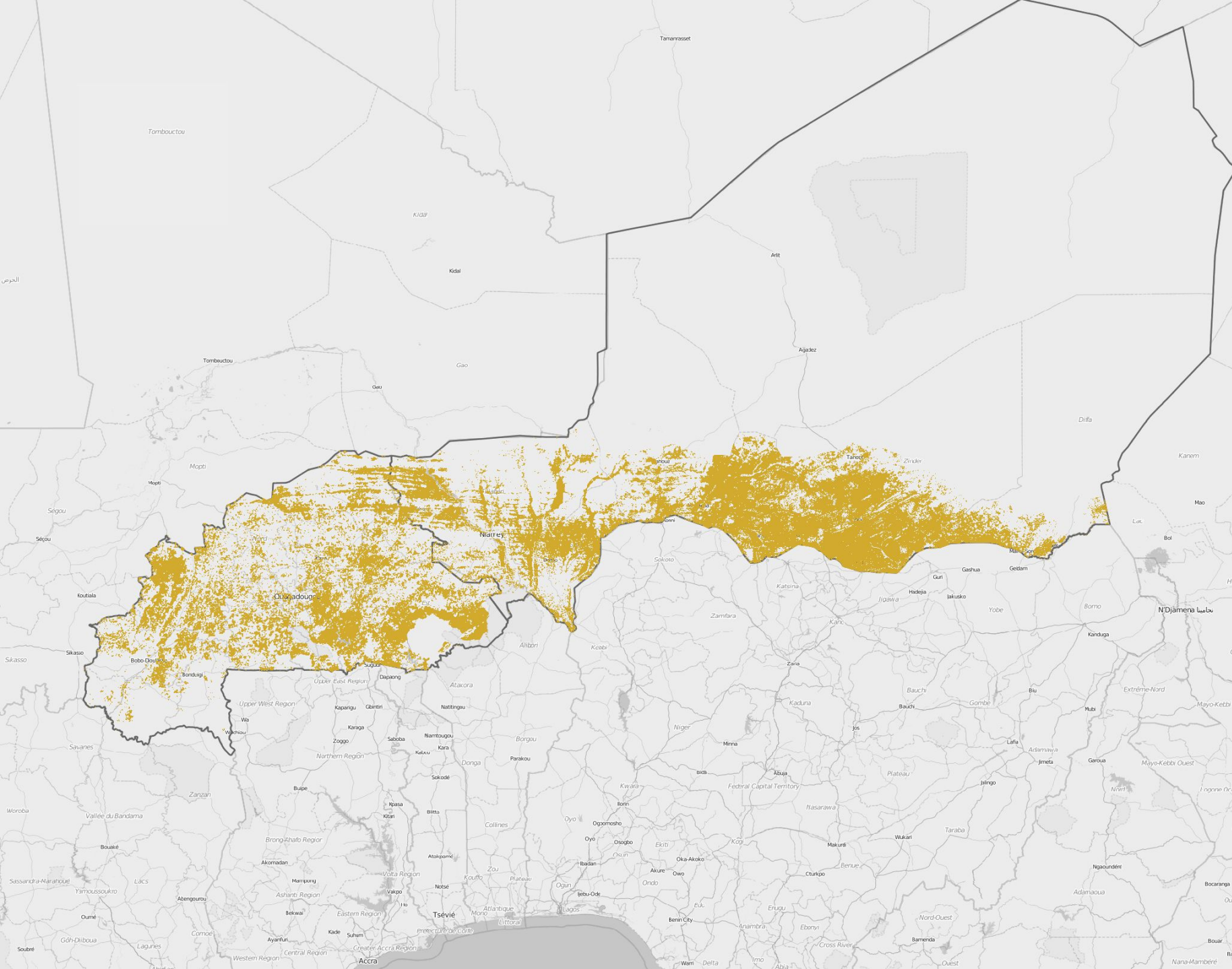




Burkina Faso

Niger



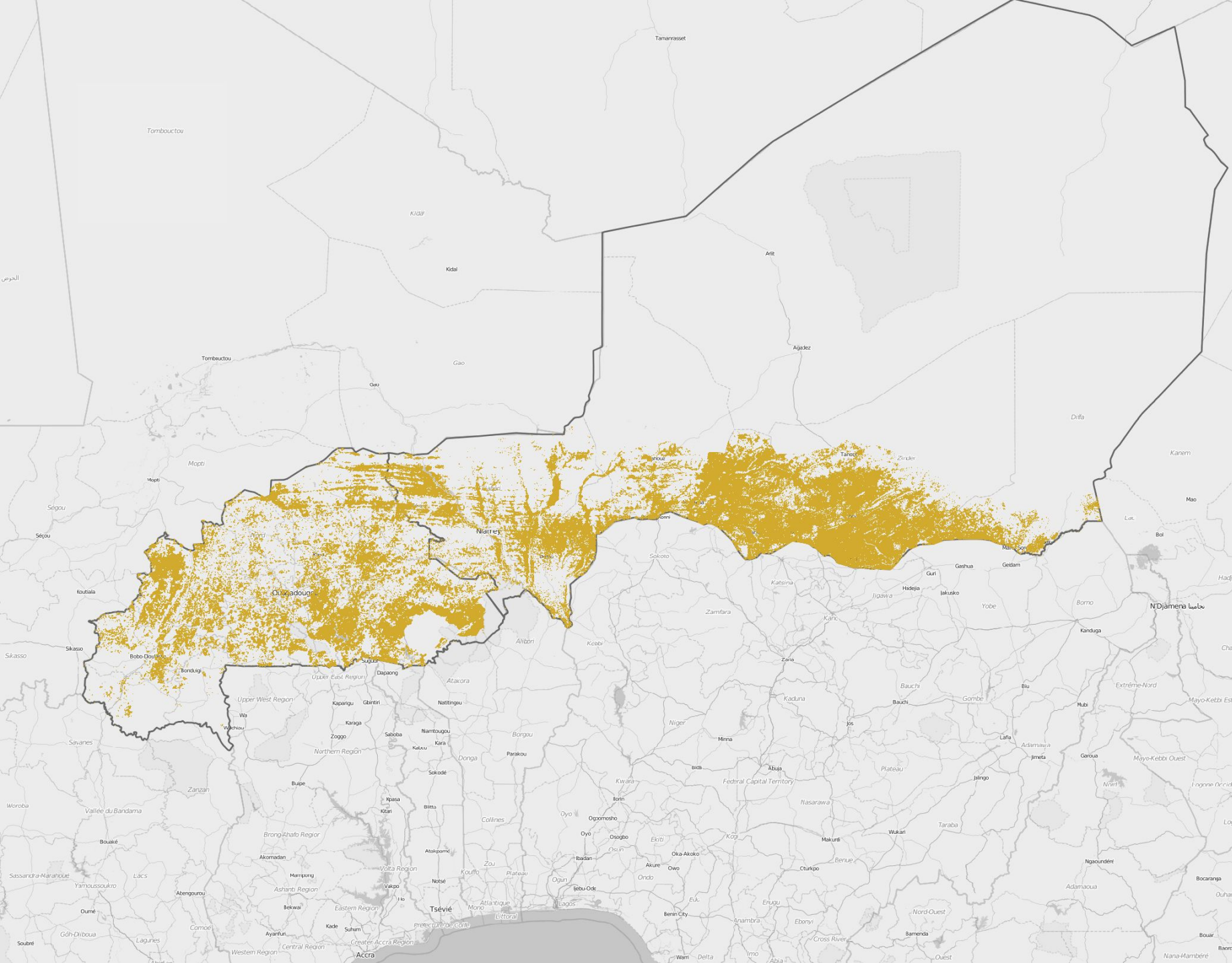


Cultivated area



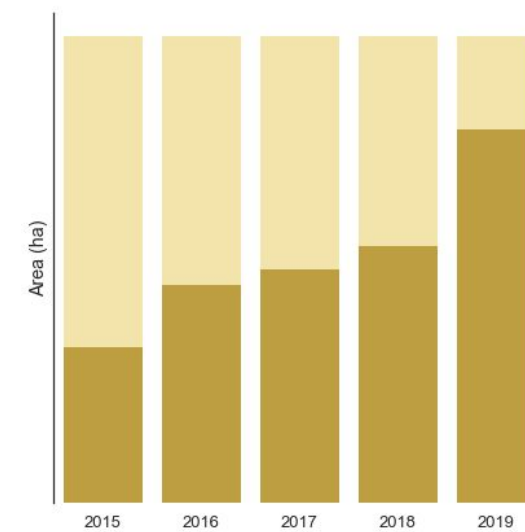
Cultivated area





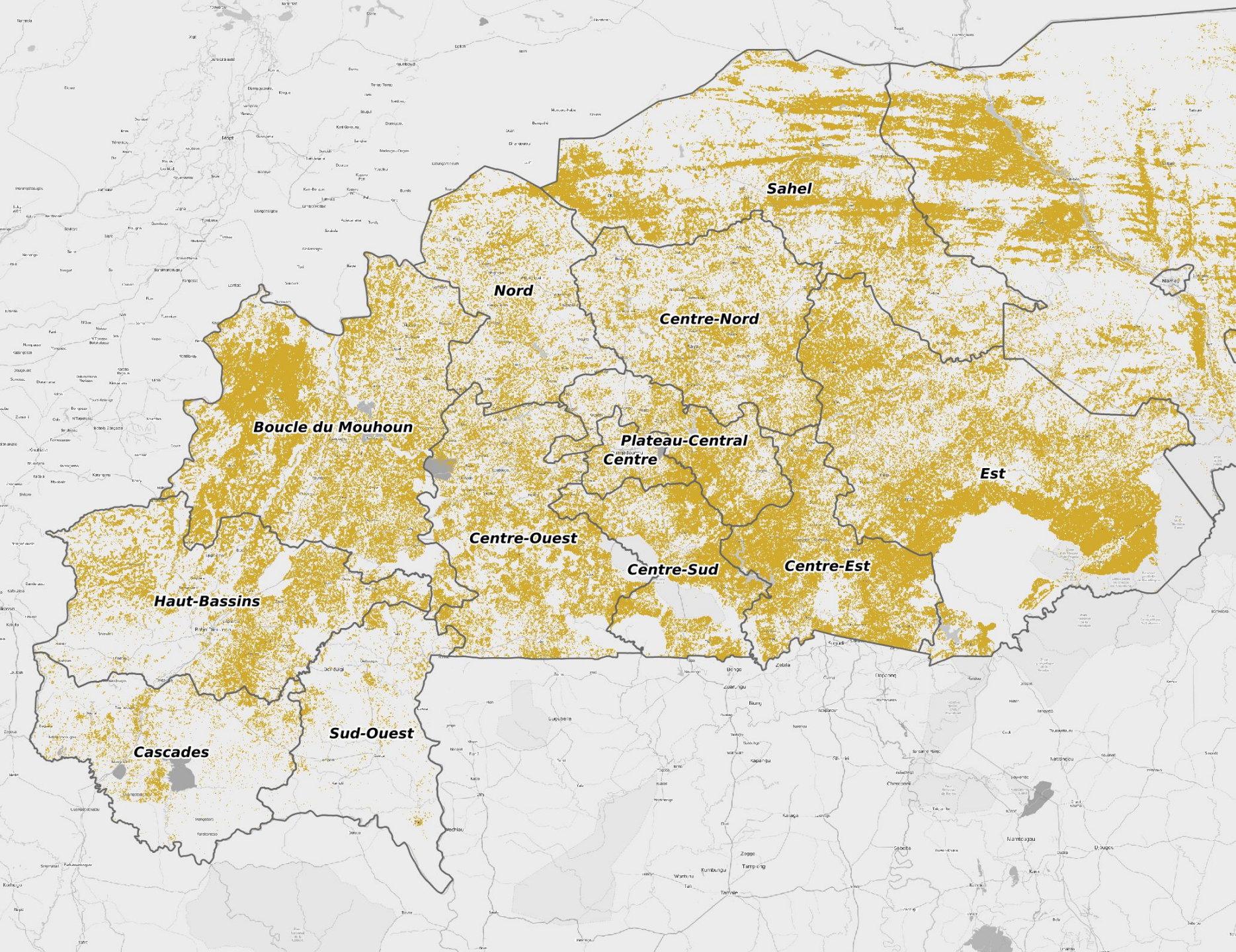
Analytics

Historical trends



● Cultivated area



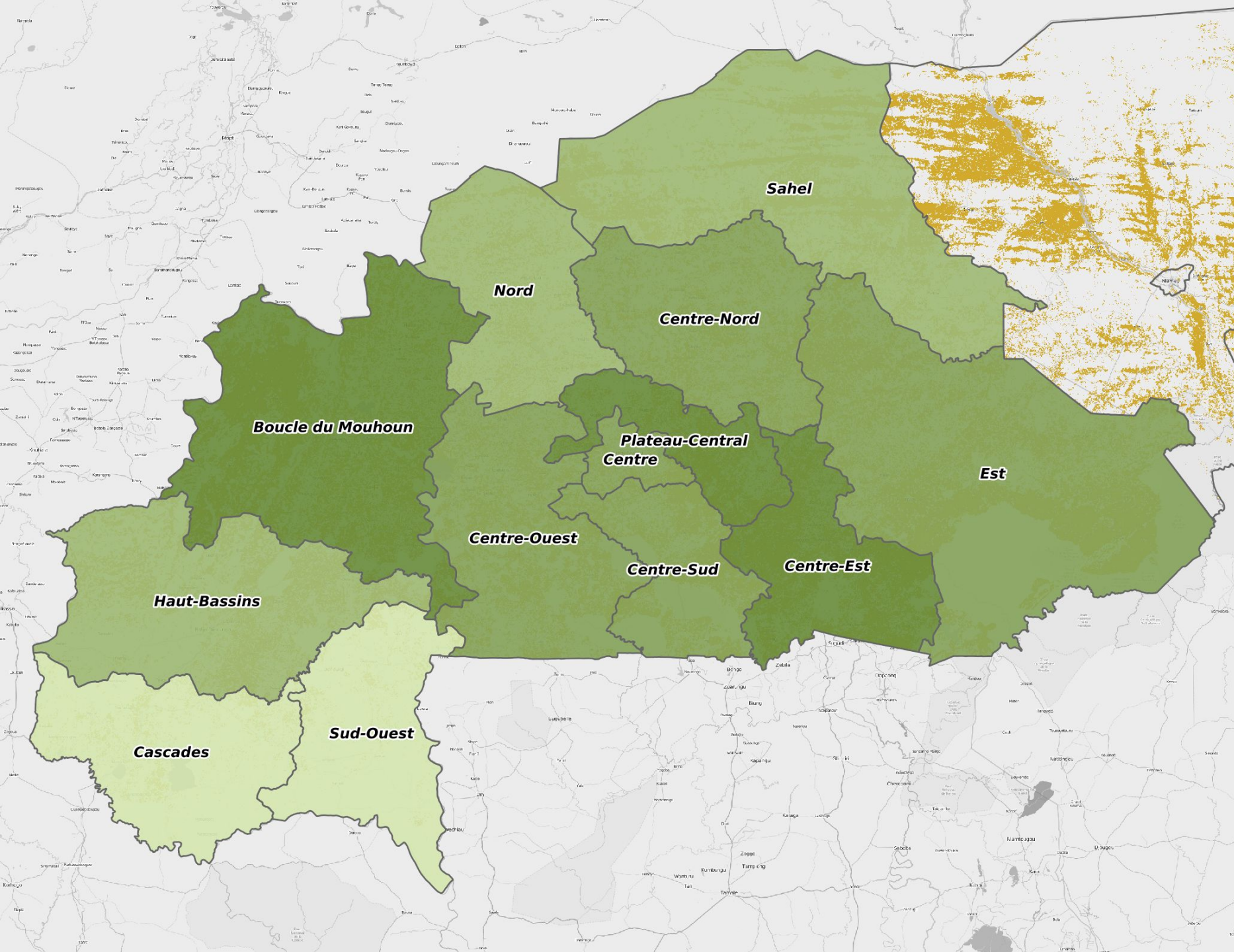


Analytics

Zoom in to compare provinces

 Cultivated area





Analytics

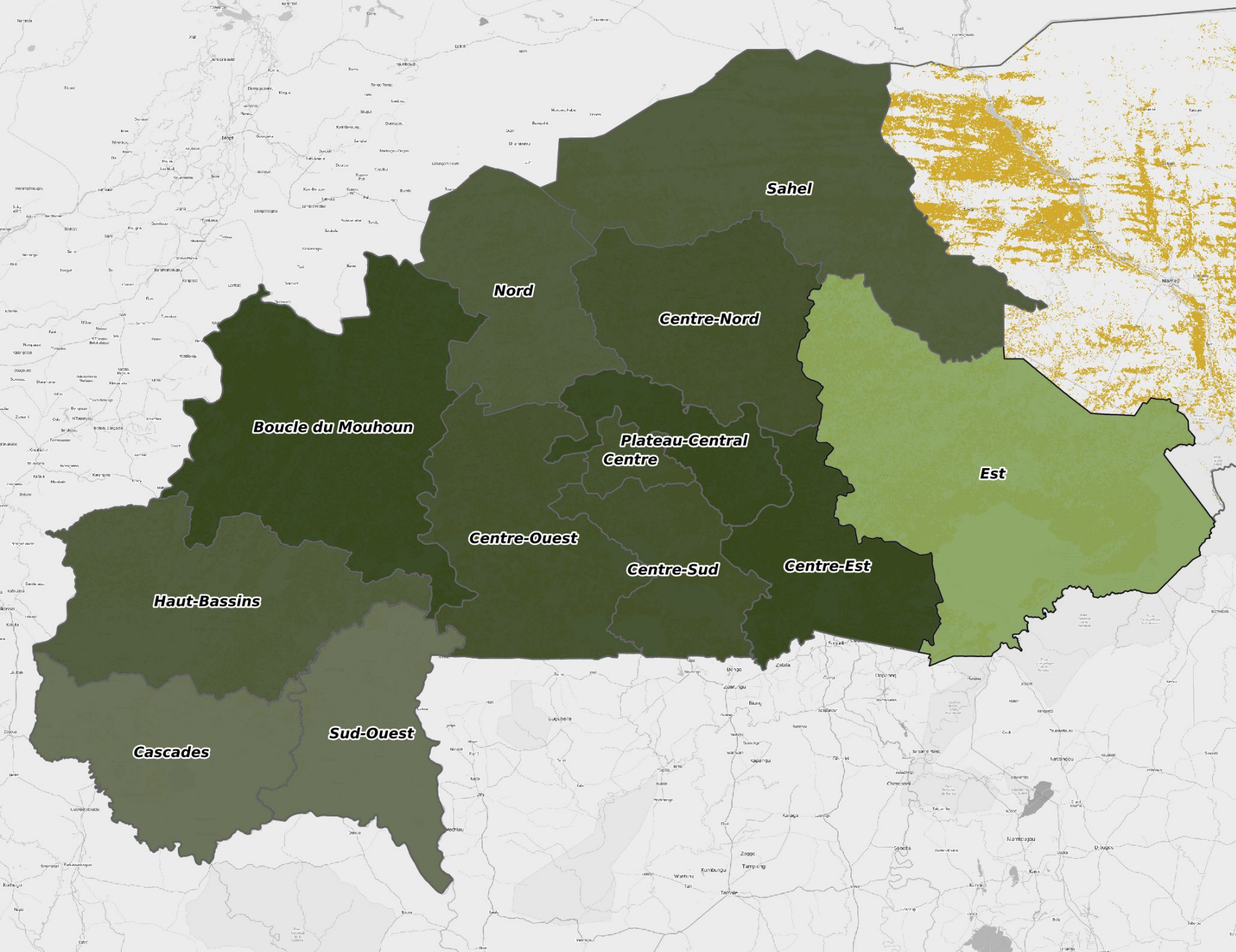
Zoom in to compare provinces

Add data components like **productivity**

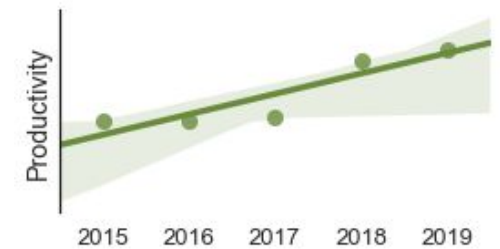
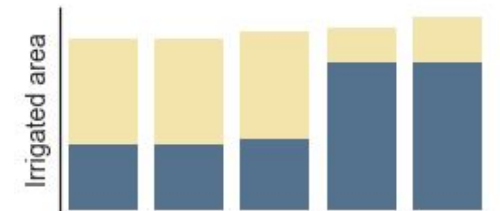
And get **reports**

 Cultivated area



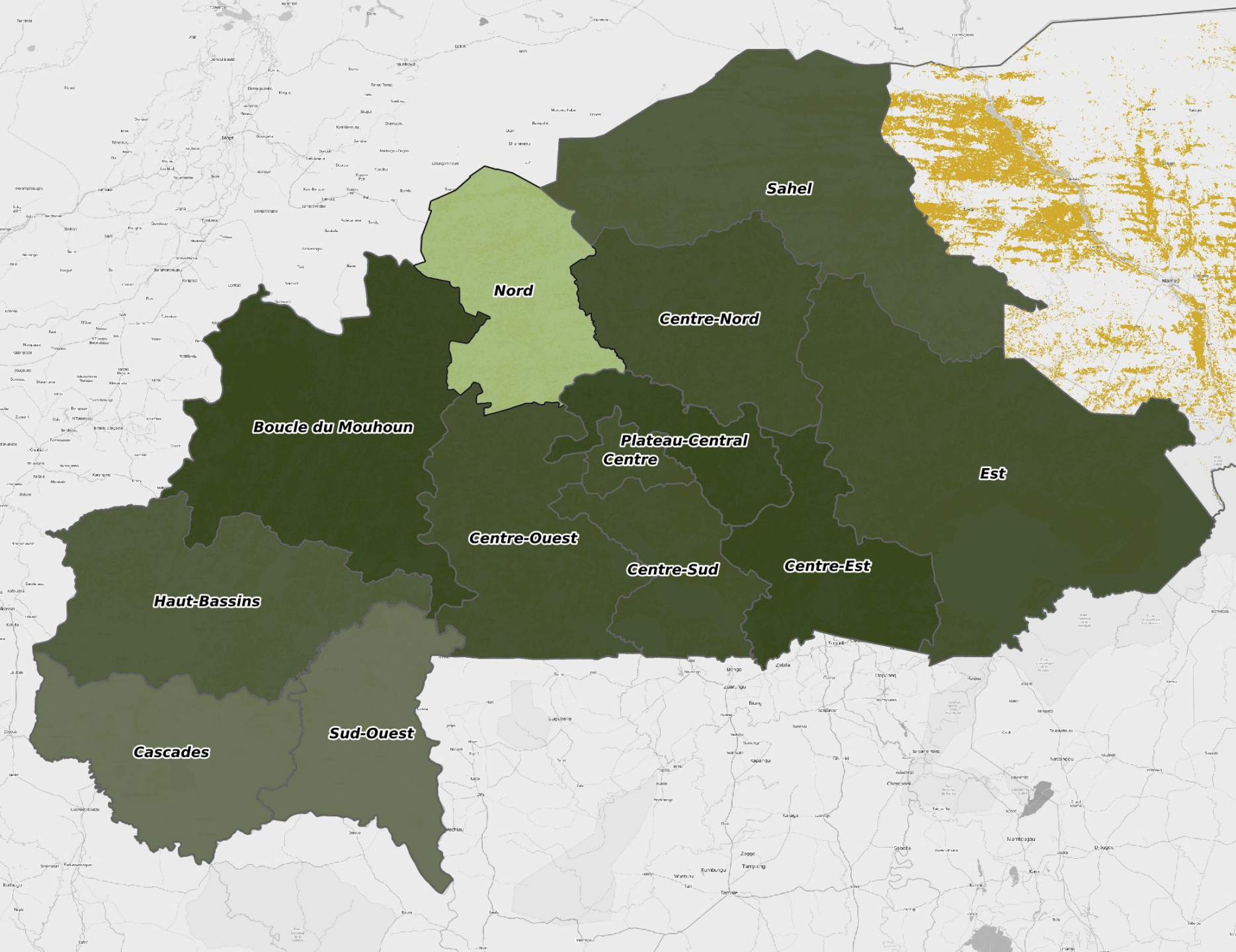


Est analytics



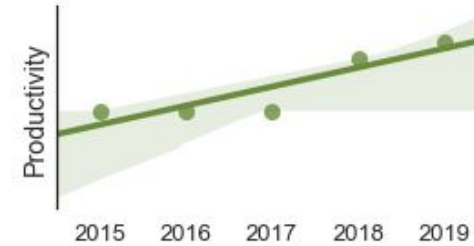
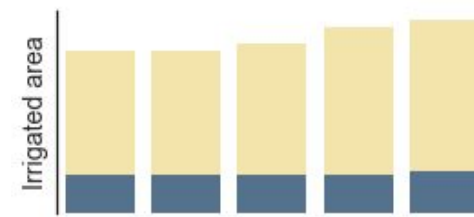
-  Cultivated area
-  Maize
-  Rice
-  Irrigated area





Nord

analytics



-  Cultivated area
-  Maize
-  Rice
-  Irrigated area



ABOUT OUR POSITIVE IMPACT

We create **actionable** information from space data to enable our clients to **feed the world** while protecting the world's **natural resources**



SATELLITE DATA



SATELLITE DATA

1. Open satellite data
 - a. NASA: Landsat
 - b. ESA: Sentinel 2, Sentinel 1
2. Sentinel 2 bands: true color, false color
3. Search & Download





SENTINEL 2

TRUE COLOR

10m

2018-06-30





SENTINEL 2

FALSE COLOR

20m

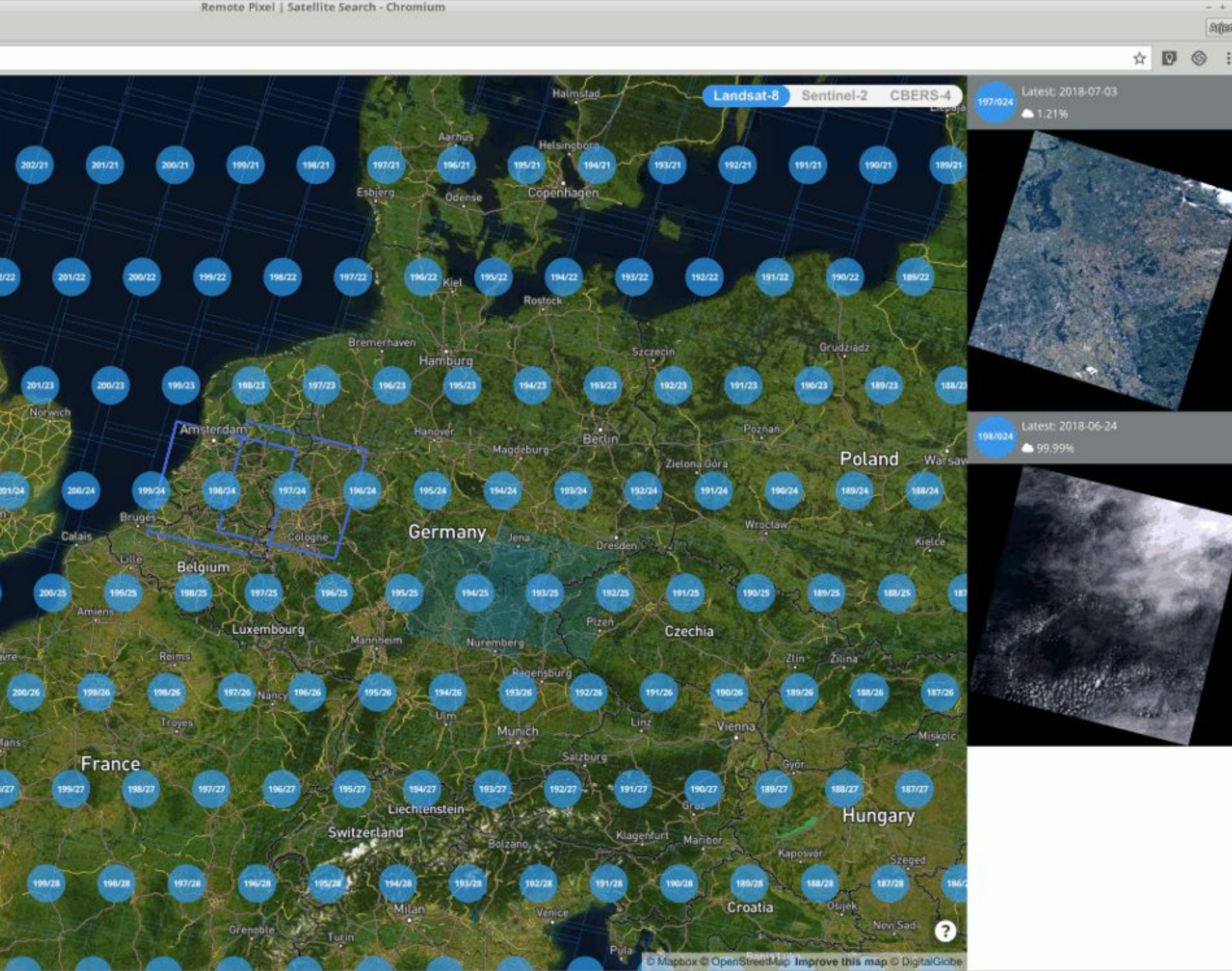
2018-06-30



SEARCH & DOWNLOAD

1. Remote Pixel search.remotepixel.ca
2. Copernicus Hub scihub.copernicus.eu





SEARCH

search.remotepixel.ca

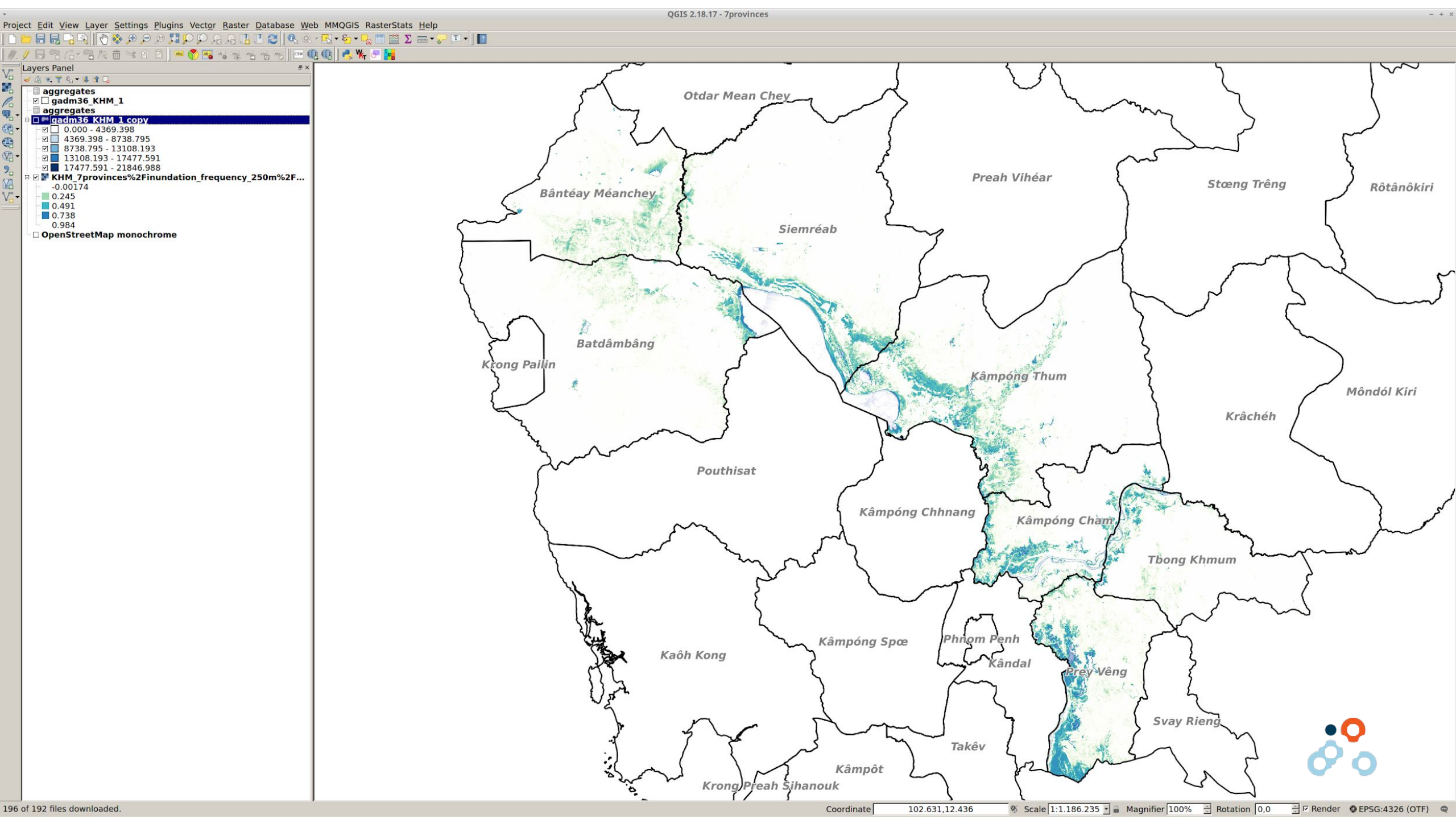
Sentinel 2

Landsat



TOOLS





step

science toolbox exploitation platform



ESA STEP **TOOLBOXES** DOWNLOAD GALLERY DOCUMENTATION COMMUNITY THIRD PARTY PLUGINS

SNAP

Sentinel 1 Toolbox
Sentinel 2 Toolbox
Sentinel-3 Toolbox
SMOS Toolbox
Proba-V Toolbox
Download
Community
Useful Links



[Home](#) > [Toolboxes](#) > SNAP

SNAP

A common architecture for all Sentinel Toolboxes is being jointly developed by Brockmann Consult, Array Systems Computing and C-S called the **Sentinel Application Platform (SNAP)**.

The SNAP architecture is ideal for Earth Observation processing and analysis due to the following technological innovations: Extensibility, Portability, Modular Rich Client Platform, Generic EO Data Abstraction, Tiled Memory Management, and a Graph Processing Framework.

Feature Highlights

- Common architecture for all Toolboxes
- Very **fast image display and navigation** even of giga-pixel images
- Graph Processing Framework (GPF): for creating user-defined processing chains
- Advanced **layer management** allows adding and manipulation of new overlays such as images of other bands, images from WMS servers or ESRI shapefiles
- Rich **region-of-interest** definitions for **statistics** and various **plots**
- Easy **bitmask** definition and overlay
- Flexible **band arithmetic** using arbitrary mathematical expressions
- Accurate **reprojection** and **ortho-rectification** to common map projections,
- Geo-coding and rectification using **ground control points**
- Automatic SRTM DEM download and tile selection
- Product library for scanning and cataloguing large archives efficiently
- Multithreading and Multi-core processor support
- Integrated WorldWind visualisation

SNAP Frequently Asked Questions

SNAP is using the following technologies

- [NetBeans platform](#) – desktop application framework
- [Install4J](#) – multi-platform installation builder

Search...

seom
scientific exploitation
of operational missions

2018



Mapping Urban Areas from Space
(MUAS 2018)



EO Open Science 2018



8th Advanced Land Training Course

2017



EO Open Science 2017



TOOLS

SATELLIGENCE **CLASSIFIER**
XGBoost / Random Forest ML

<https://gitlab.com/satelligence/classifier>



TOOLS: PROGRAMMING

Python Python Python
Python Python

Numpy

Dask

Scipy

Pandas

Xarray

Python Python

```
31 del
32 self.file = None
33 self.fingerprints = set()
34 self.logdups = True
35 self.debug = debug
36 self.logger = logging.getLogger(__name__)
37 if path:
38     self.file = open(os.path.join(path, 'request_fingerprints.txt'), 'a')
39     self.file.seek(0)
40     self.fingerprints.update(e.request for e in request_list)
41
42 @classmethod
43 def from_settings(cls, settings):
44     debug = settings.getbool('DEBUG', False)
45     return cls(job_dir(settings), debug)
46
47 def request_seen(self, request):
48     fp = self.request_fingerprint(request)
49     if fp in self.fingerprints:
50         return True
51     self.fingerprints.add(fp)
52     if self.file:
53         self.file.write(fp + os.linesep)
54
55 def request_fingerprint(self, request):
56     return request_fingerprint(request)
```

INFRASTRUCTURE





INFRASTRUCTURE DEV

Google Earth Engine
SentinelHub
Dias (ESA)

Cloud (AWS, GCE, Digital
Ocean)

Your laptop





INFRASTRUCTURE PRODUCTION

Google Earth Engine
SentinelHub
Dias (ESA)

Cloud (AWS, GCE, Digital Ocean)

~~Your laptop~~





INFRASTRUCTURE CLOUD

The data is already there

Standards are moving to
cloud native
geoprocessing (trends)



TRENDS



TRENDS

Cloud Native Geoprocessing

- COG
- ARD
- SPAT

<https://medium.com/@cholmes>



TRENDS CLOUD NATIVE GEOPROCESSING

Step-by-Step Guide to Building a Big Data Portal

<https://medium.com/pangeo/step-by-step-guide-to-building-a-big-data-portal-e262af1c2977>



TRENDS CLOUD NATIVE GEOPROCESSING

Step-by-Step Guide to Building a Big Data Portal

1. Place your Big Data in cloud object storage in a self-describing, cloud-optimized format.
2. Congratulations! Your Big Data Portal is now complete.

Take the rest of the day off.

<https://medium.com/pangeo/step-by-step-guide-to-building-a-big-data-portal-e262af1c2977>



TRENDS WHO TO FOLLOW

RadiantEarth

DevelopmentSeed

Mapbox



SUCCESS!



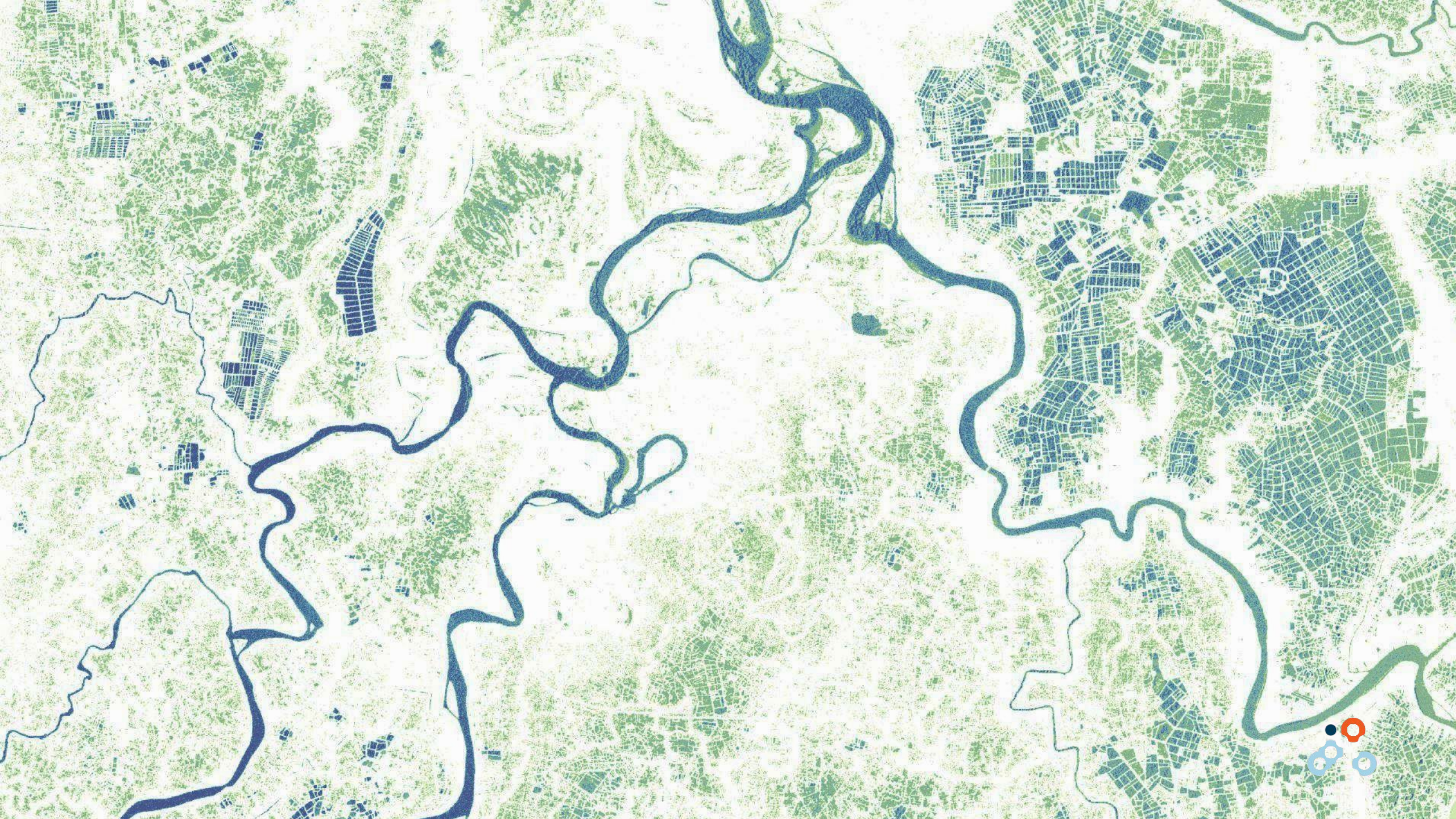
HOW TO START YOUR OWN **REMOTE SENSING** COMPANY



RECIPE

1. Download & explore **satellite images**
2. Get your **tools**
3. Pick your **platform**
4. Ride the **trend** wave
5. **Conquer world**







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WHY YOU WILL FAIL

Clouds & Haze

Sensor artefacts

Scaling (your laptop is too small)

Lack of training, calibration, validation data

