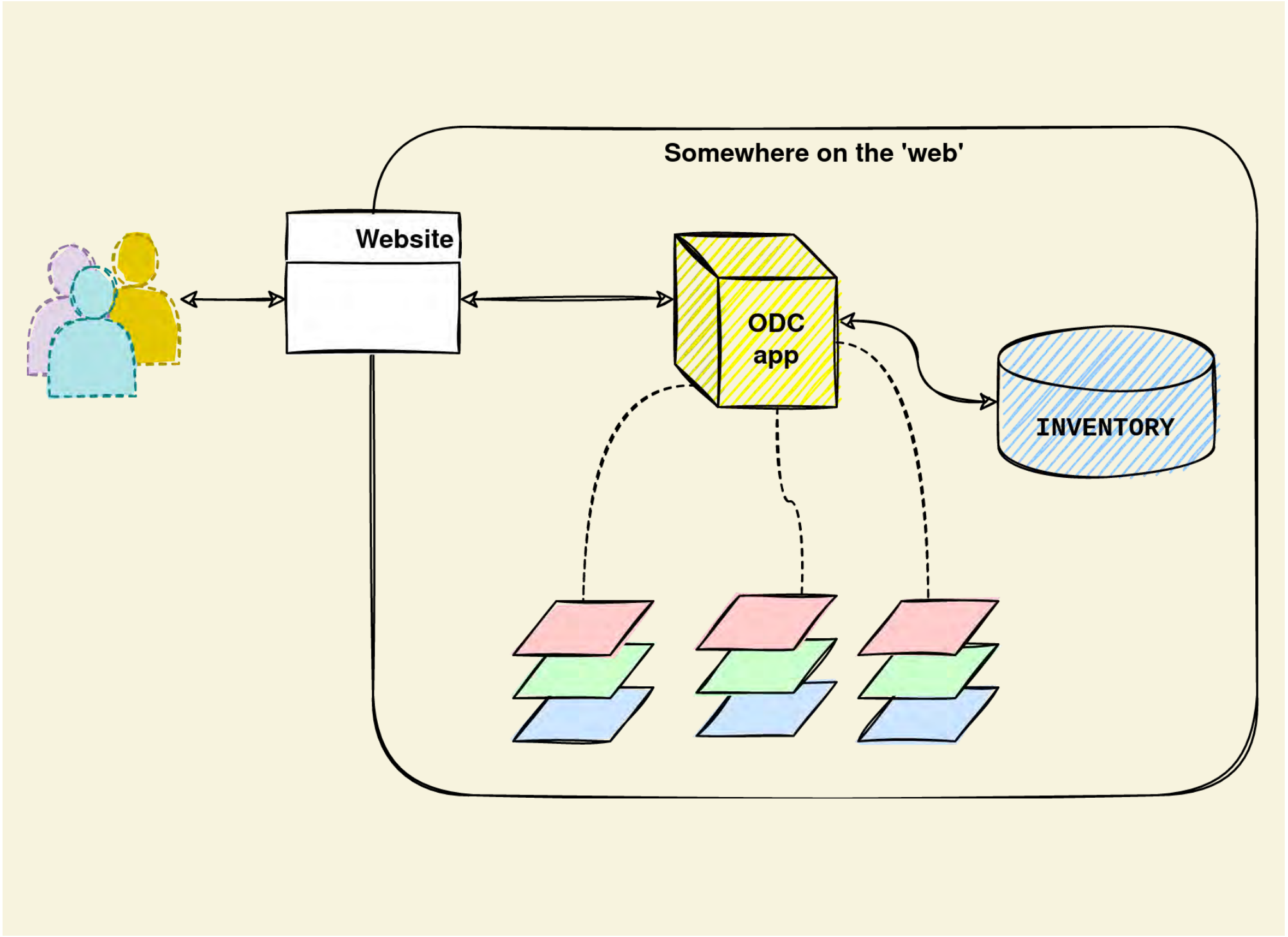
OPEN DATA CUBE

Een aardobservatie engine die je kunt bezitten.

Aron Gergely

WAT IS ODC?

"A Python library that facilitates working with large volumes of raster data"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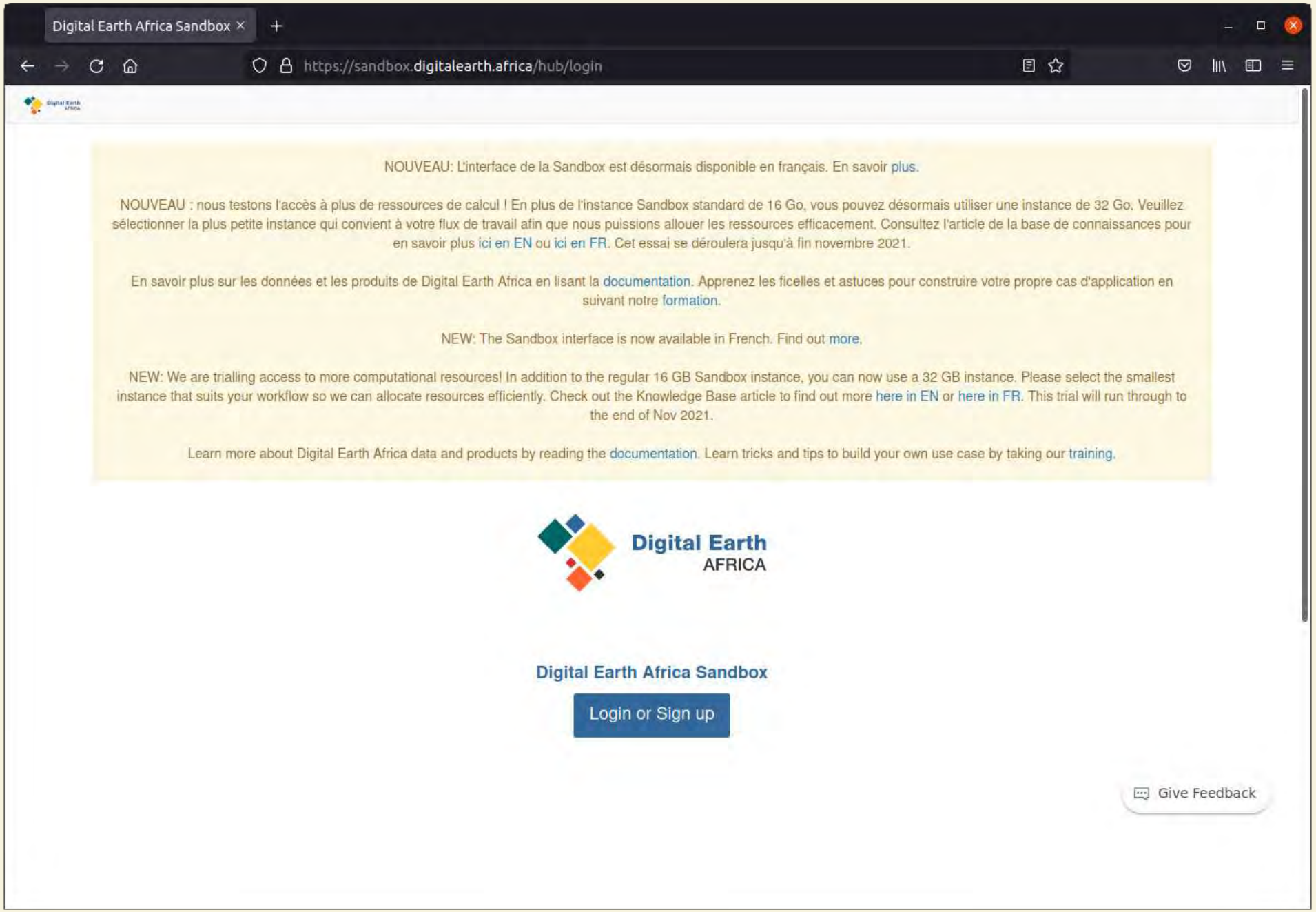
ODC
app
INVENTORY


Digital Earth Africa Sandbox ×
https://sandbox.digitalearth.africa/hub/login
NOUVEAU: L'interface de la Sandbox est désormais disponible en français. En savoir plus.
NOUVEAU : nous testons l'accès à plus de ressources de calcul ! En plus de l'instance Sandbox standard de 16 Go, vous pouvez désormais utiliser une instance de 32 Go. Veuillez sélectionner la plus petite instance qui convient à votre flux de travail afin que nous puissions allouer les ressources efficacement. Consultez l'article de la base de connaissances pour en savoir plus ici en EN ou ici en FR. Cet essai se déroulera jusqu'à fin novembre 2021.
En savoir plus sur les données et les produits de Digital Earth Africa en lisant la documentation. Apprenez les ficelles et astuces pour construire votre propre cas d'application en suivant notre formation.
NEW: The Sandbox interface is now available in French. Find out more.
NEW: We are trialling access to more computational resources! In addition to the regular 16 GB Sandbox instance, you can now use a 32 GB instance. Please select the smallest instance that suits your workflow so we can allocate resources efficiently. Check out the Knowledge Base article to find out more here in EN or here in FR. This trial will run through to the end of Nov 2021.
Learn more about Digital Earth Africa data and products by reading the documentation. Learn tricks and tips to build your own use case by taking our training.
Digital Earth
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Digital Earth Africa Sandbox
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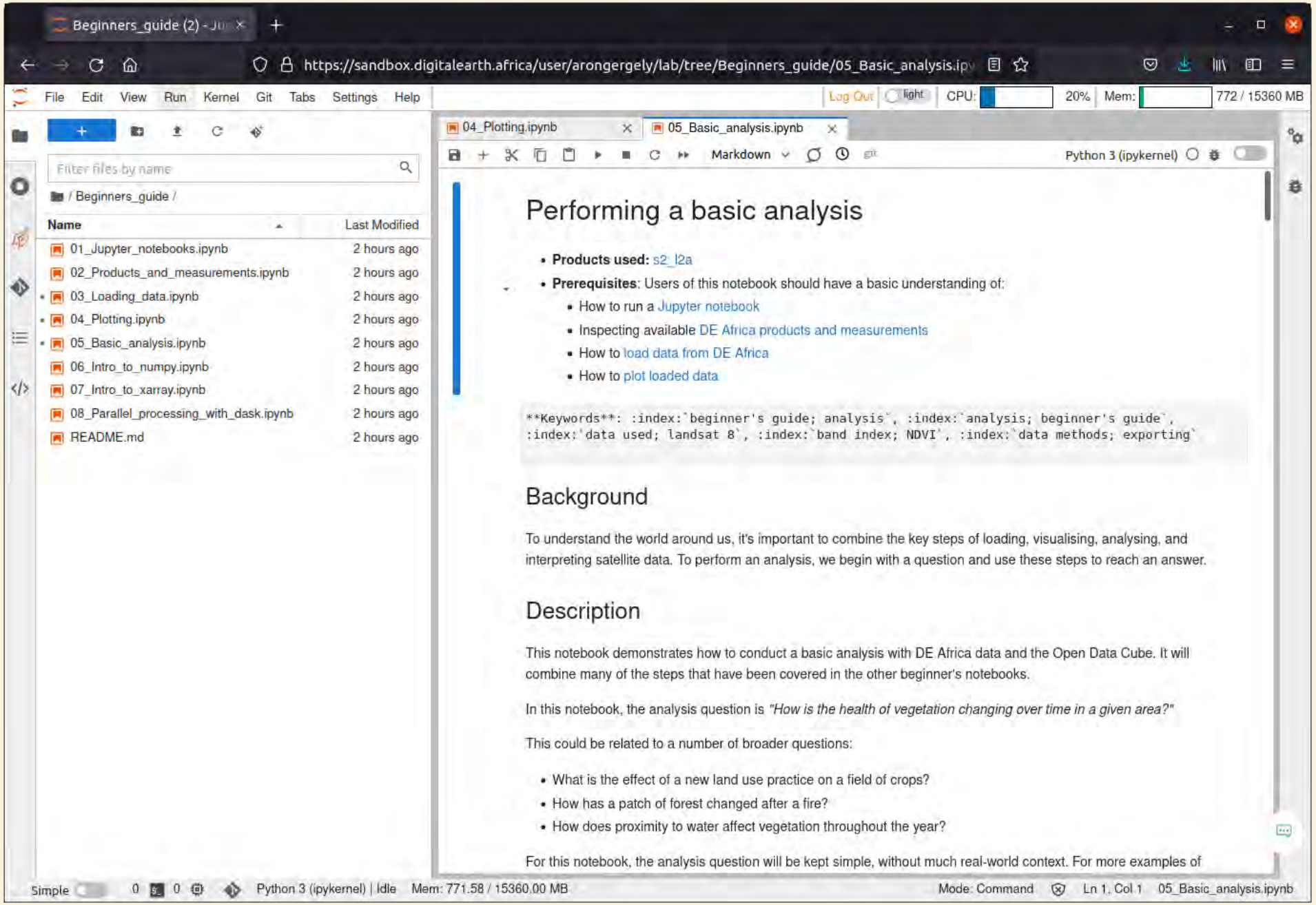
Beginners_guide (2) - Ju
https://sandbox.digitalearth.africa/user/arongergely/lab/tree/Beginners_guide/05_Basic_analysis.ipy
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04_Plotting.ipynb 2 hours ago
05_Basic_analysis.ipynb 2 hours ago
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07_Intro_to_xarray.ipynb 2 hours ago
08_Parallel_processing_with_dask.ipynb 2 hours ago
README.md 2 hours ago
04_Plotting.ipynb
05_Basic_analysis.ipynb
Markdown
Python 3 (ipykernel)
Performing a basic analysis
Products used: s2_l2a
Prerequisites: Users of this notebook should have a basic understanding of:
How to run a Jupyter notebook
Inspecting available DE Africa products and measurements
How to load data from DE Africa
How to plot loaded data
Keywords: :index:`beginner's guide; analysis`, :index:`analysis; beginner's guide`, :index:`data used; landsat 8`, :index:`band index; NDVI`, :index:`data methods; exporting`
Background
To understand the world around us, it's important to combine the key steps of loading, visualising, analysing, and interpreting satellite data. To perform an analysis, we begin with a question and use these steps to reach an answer.
Description
This notebook demonstrates how to conduct a basic analysis with DE Africa data and the Open Data Cube. It will combine many of the steps that have been covered in the other beginner's notebooks.
In this notebook, the analysis question is "How is the health of vegetation changing over time in a given area?"
This could be related to a number of broader questions:
What is the effect of a new land use practice on a field of crops?
How has a patch of forest changed after a fire?
How does proximity to water affect vegetation throughout the year?
For this notebook, the analysis question will be kept simple, without much real-world context. For more examples of
Simple 0 0 Python 3 (ipykernel) | Idle Mem: 771.58 / 15360.00 MB
Mode: Command Ln 1, Col 1 05_Basic_analysis.ipynb

Beginners_guide (2) - Jup

https://sandbox.digitalearth.africa/user/arongergely/lab/tree/Beginners_guide/05_Basic_analysis.ipynb

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Launcher | 04_Plotting.ipynb | 05_Basic_analysis.ipynb

Markdown git Python 3 (ipykernel)

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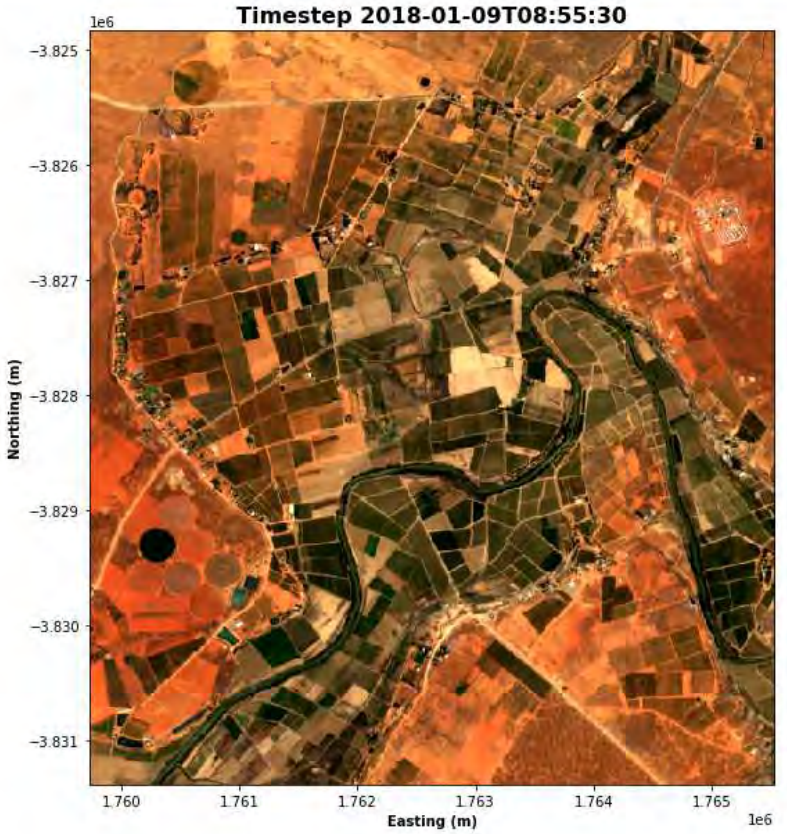
07_Intro_to_xarray.ipynb	25 minutes ago
08_Parallel_processing_with_dask.ipynb	25 minutes ago
README.md	25 minutes ago

```
ax.set_ylabel('Northing (m)', fontweight='bold')

# Display the plot
plt.show()
```



Step 4: Calculate vegetation health

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Beginners_guide (2) - Jup

https://sandbox.digitalearth.africa/user/arongergely/lab/tree/Beginners_guide/05_Basic_analysis.ipynb

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05_Basic_analysis.ipynb	2 minutes ago
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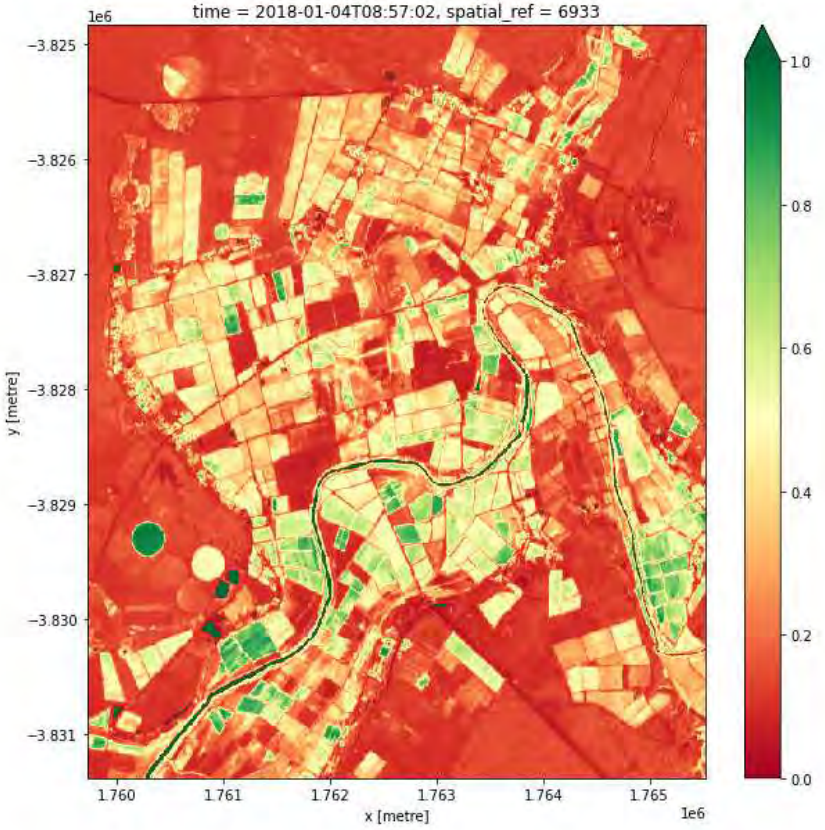
07_Intro_to_xarray.ipynb	26 minutes ago
08_Parallel_processing_with_dask.ipynb	26 minutes ago
README.md	26 minutes ago

```
ndvi_time_step = 0

# This is the simple way to plot
# Note that high values are likely to be vegetation.
plt.figure(figsize=(10, 10))
ndvi.isel(time=ndvi_time_step).plot(cmap="RdYlGn", vmin=0, vmax=1)
plt.show()
```



Step 5: Exporting data

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NumPy

xarray

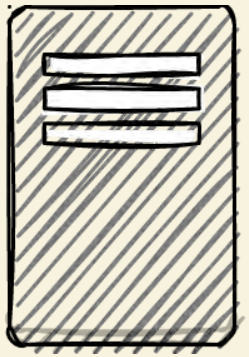
GDAL

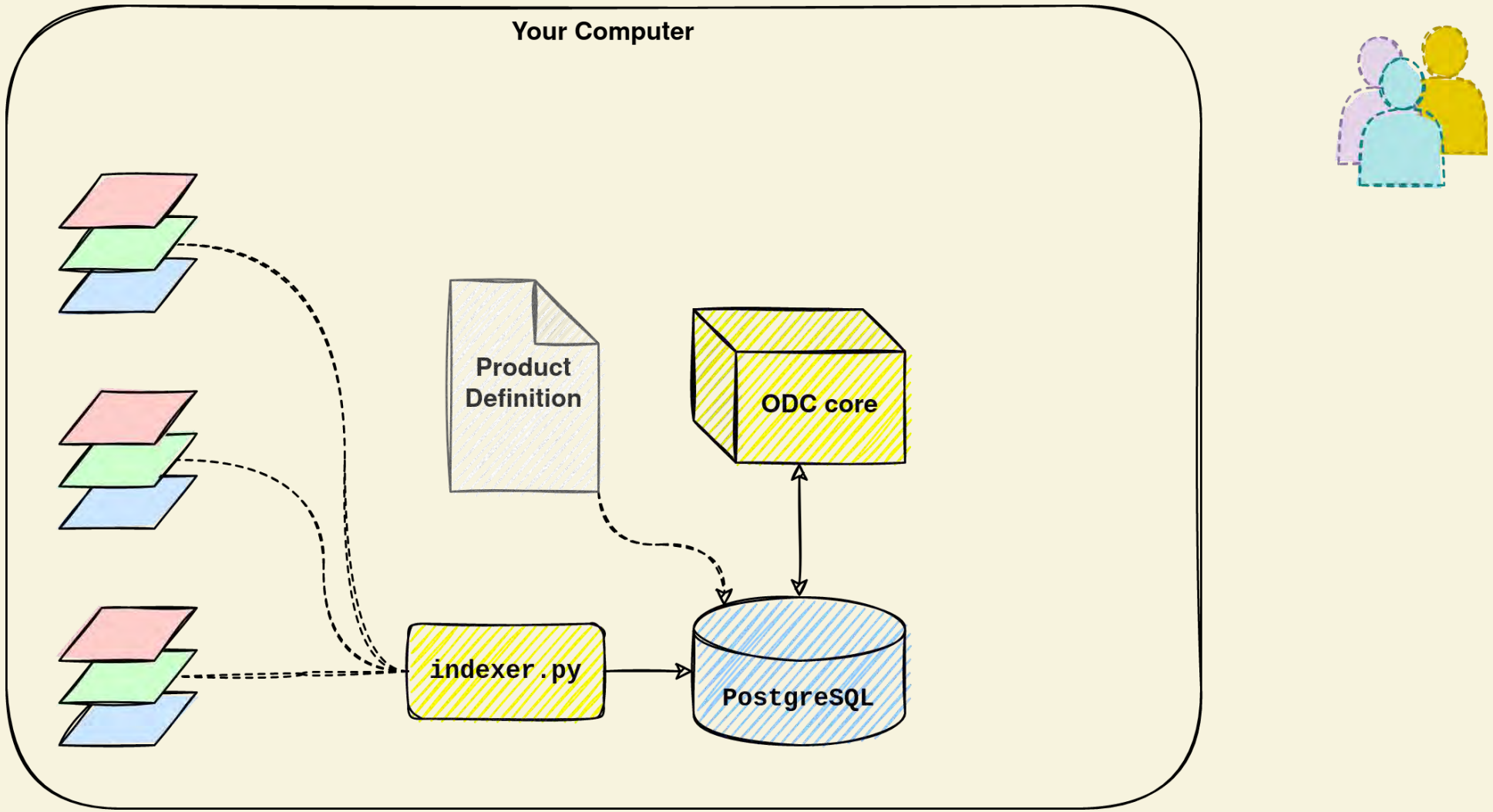
WHY SHOULD I CARE?

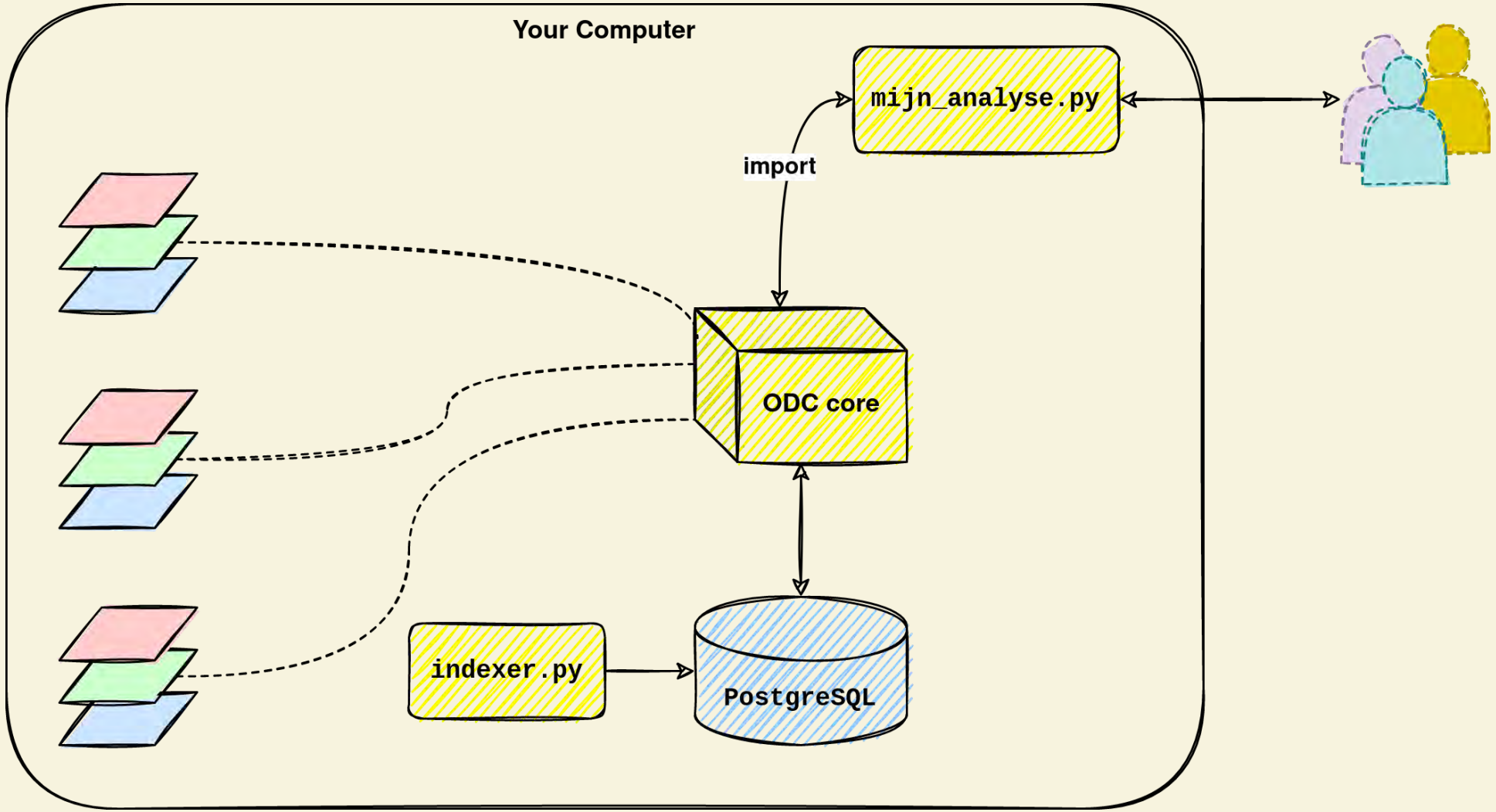
WHO IS IN CHARGE?

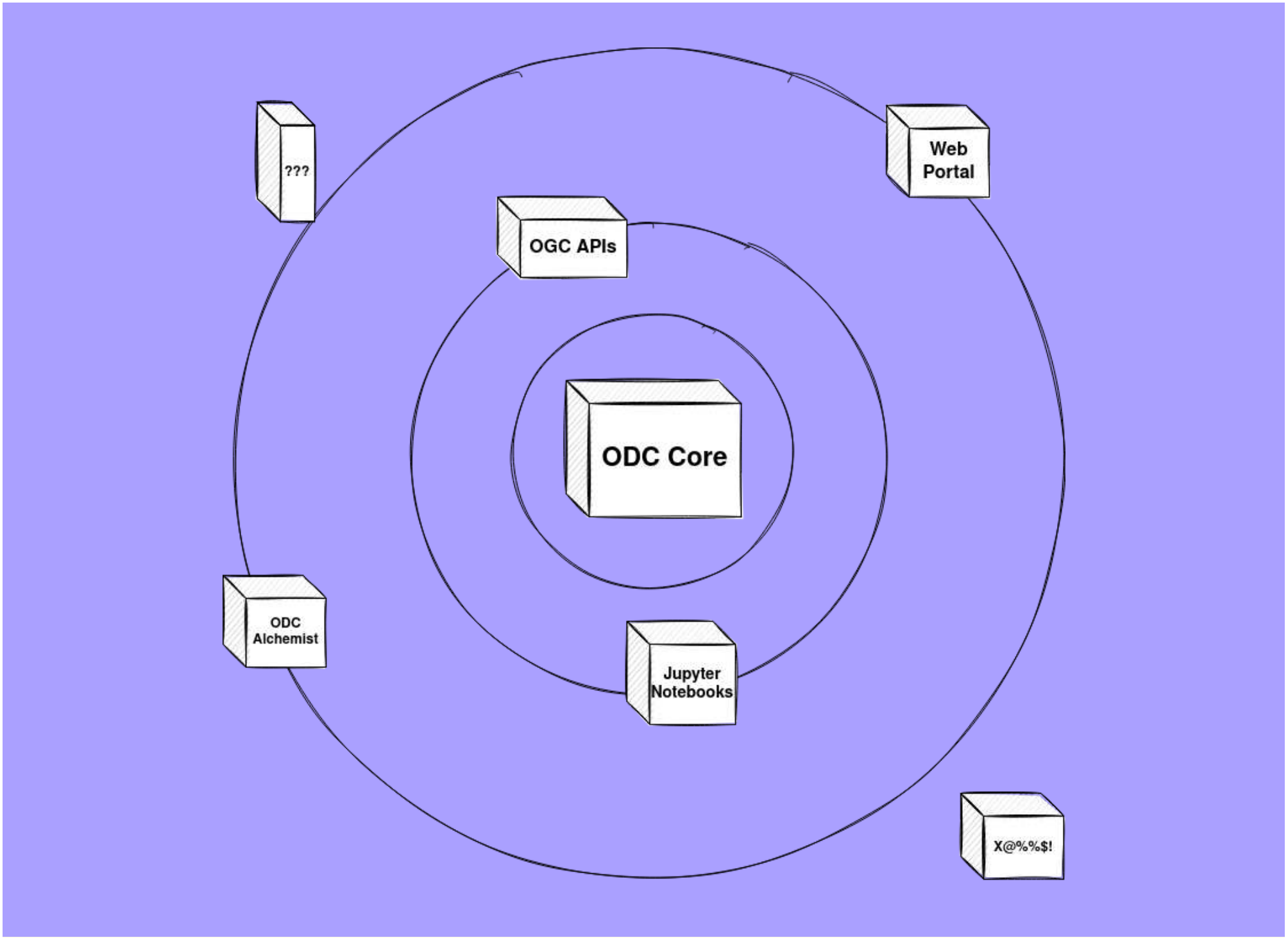
FREE

SET UP YOUR OWN




Your Computer
Product Definition
ODC core
indexer.py
PostgreSQL


Your Computer
mijn_analyse.py
import
ODC core
indexer.py
PostgreSQL


???
Web Portal
OGC APIs
ODC Core
ODC Alchemist
Jupyter Notebooks
X@%%$!

Alex Leith
@alexgleith

We're getting good at this. Processing every Landsat 8 scene ever captured over Africa to build cloud free annual mosaics took two hours on a hundred spot instances.

12:05 PM · Oct 1, 2021

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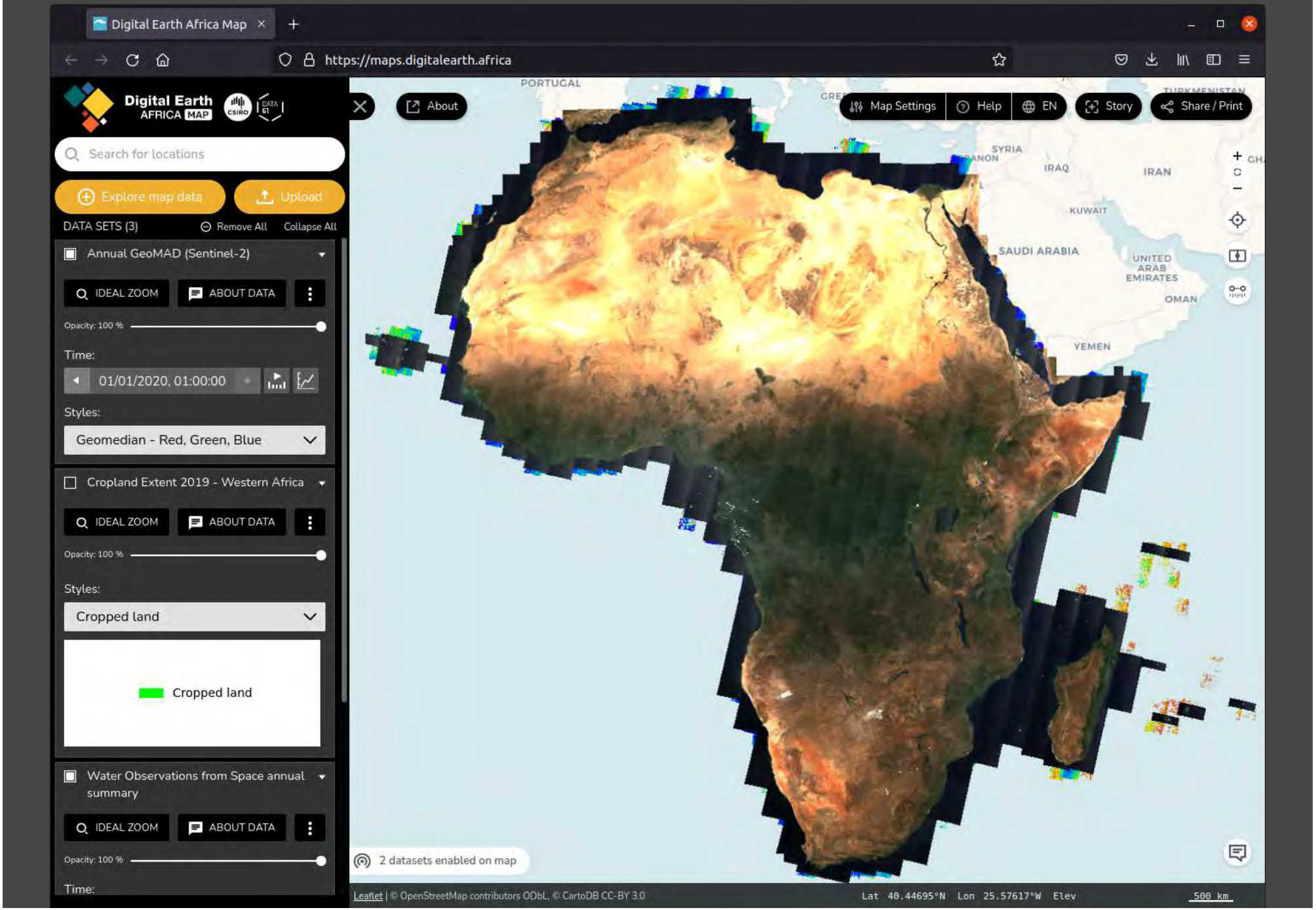
ODC AROUND THE WORLD

DIGITAL EARTH AFRICA

https://www.digitalearthafrica.org/


Digital Earth Africa Map
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Explore map data
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DATA SETS (3)
Remove All
Collapse All
Annual GeoMAD (Sentinel-2)
IDEAL ZOOM
ABOUT DATA
Opacity: 100 %
Time:
01/01/2020, 01:00:00
Styles:
Geomedian - Red, Green, Blue
Cropland Extent 2019 - Western Africa
IDEAL ZOOM
ABOUT DATA
Opacity: 100 %
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Cropped land
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Water Observations from Space annual summary
IDEAL ZOOM
ABOUT DATA
Opacity: 100 %
Time:
About
Map Settings
Help
EN
Story
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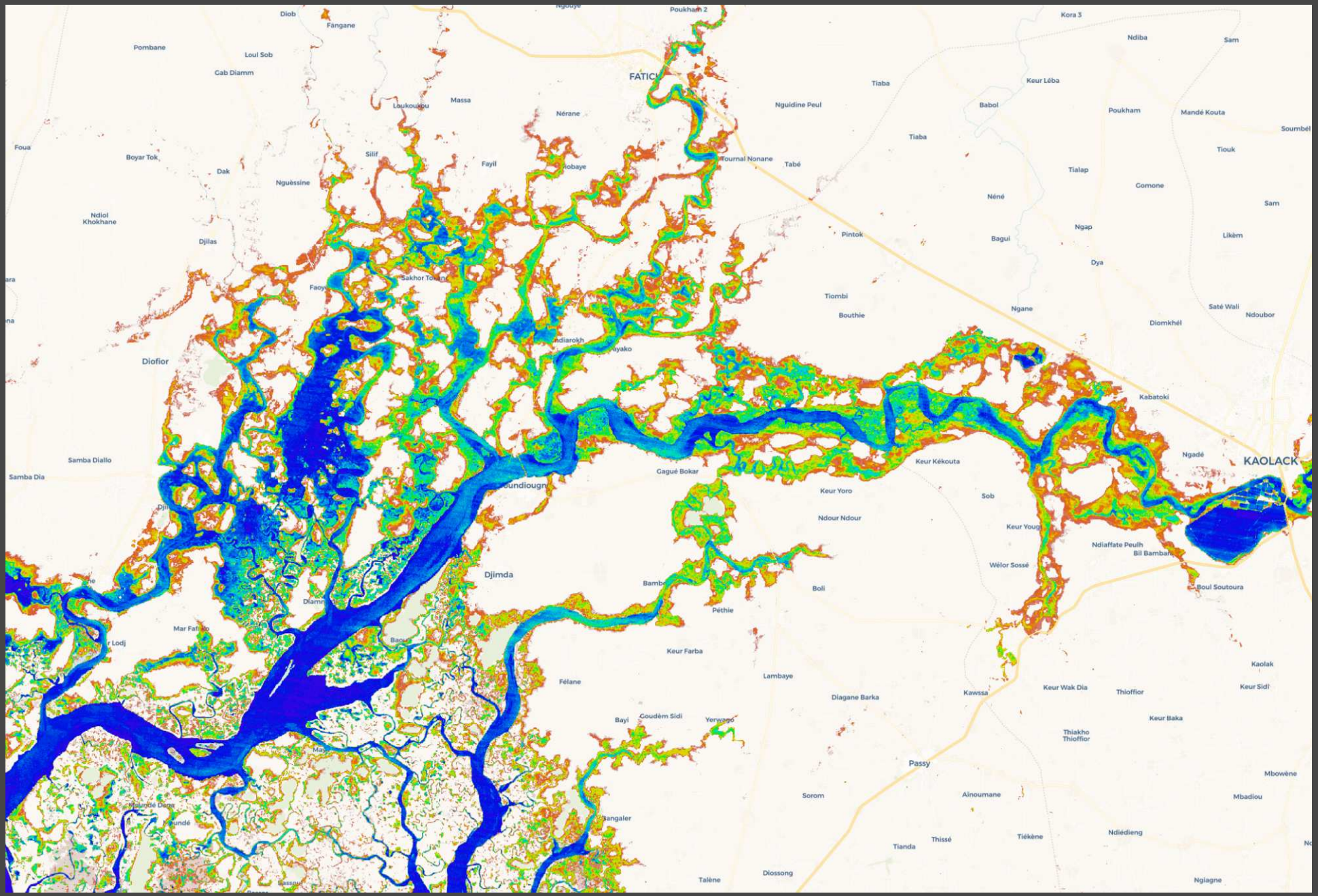
IRAQ
IRAN
KUWAIT
SAUDI ARABIA
UNITED ARAB EMIRATES
OMAN
YEMEN
2 datasets enabled on map
Leaflet | © OpenStreetMap contributors ODbL, © CartoDB CC-BY 3.0
Lat 40.44695°N Lon 25.57617°W Elev
500 km


Diob
Fangane
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Loul Sob
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Massa
Nérane
Nguidine Peul
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Mandé Kouta
Soumbél
Tiouk
Foua
Boyar Tok
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Silif
Fayil
Tournal Nonane
Tabé
Tialap
Gomone
Nguèssine
Néné
Sam
Ndiol Khokhane
Djilas
Pintok
Bagui
Ngap
Likèm
Dya
Tiombi
Bouthie
Ngane
Saté Wali
Ndoubor
Diomkhél
Diofior
Kabatoki
Samba Diallo
Samba Dia
Gagué Bokar
Keur Kékouta
Ngadé
KAOLACK
Keur Yoro
Sob
Ndour Ndour
Ndiaffate Peulh
Bil Bambara
Djimda
Wélor Sossé
Boul Soutoura
Boli
Péthie
Keur Farba
Kaolak
Lambaye
Félane
Kawssa
Keur Wak Dia
Thioffior
Keur Sidi
Diagane Barka
Keur Baka
Bayi
Coudèm Sidi
Yerwago
Thiakho Thioffior
Passy
Mbowène
Sorom
Ainoumane
Mbadiou
Bangaler
Ndiédieng
Tiékène
Thissé
Tianda
Talène
Diossong
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Real_world_exam - Jupy

https://sandbox.digitalearth.africa/user/arongergely/lab/tree/Real_world_examples/Urban_change_detection

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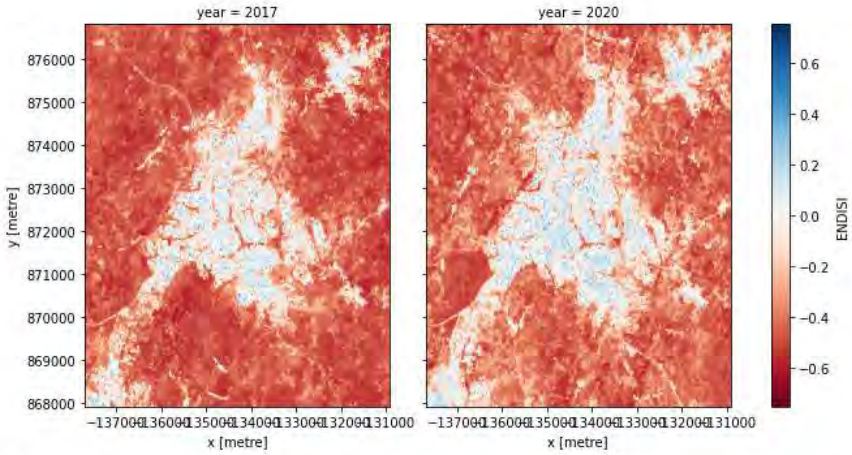
Wetlands_insight_tool.ipynb	29 minutes ago

Launcher | Urban_change_detection.ipy

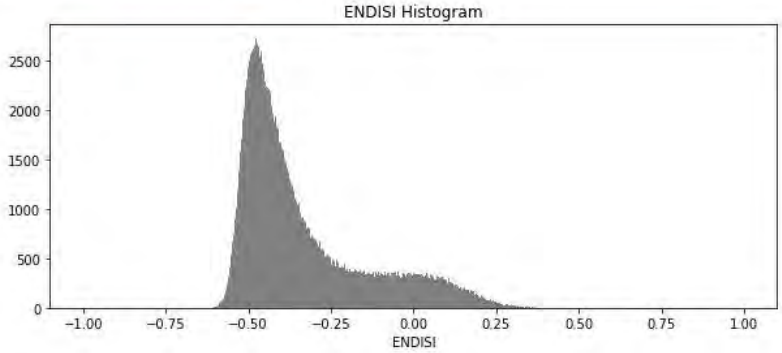
Code | Python 3 (ipykernel)

```
    figsize=(10, 5),
    robust=True
);
```



And now plot the histogram of all the pixels in the ENDISI array

[11]:
```
geomedians.ENDISI.plot.hist(bins=1000, range=(-1,1), facecolor='gray', figsize=(10, 4))
plt.title('ENDISI Histogram');
```



Calculate urban extent

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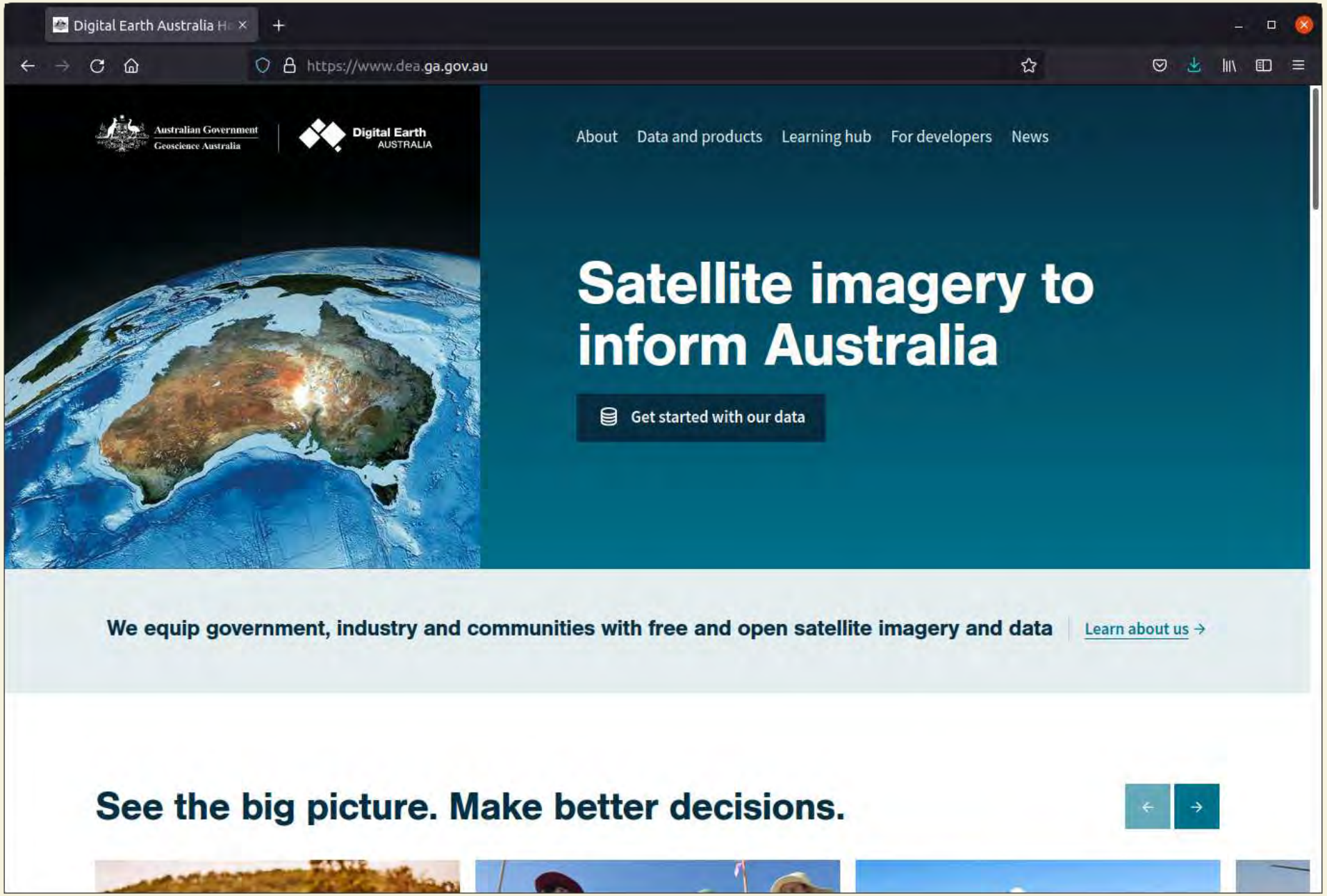
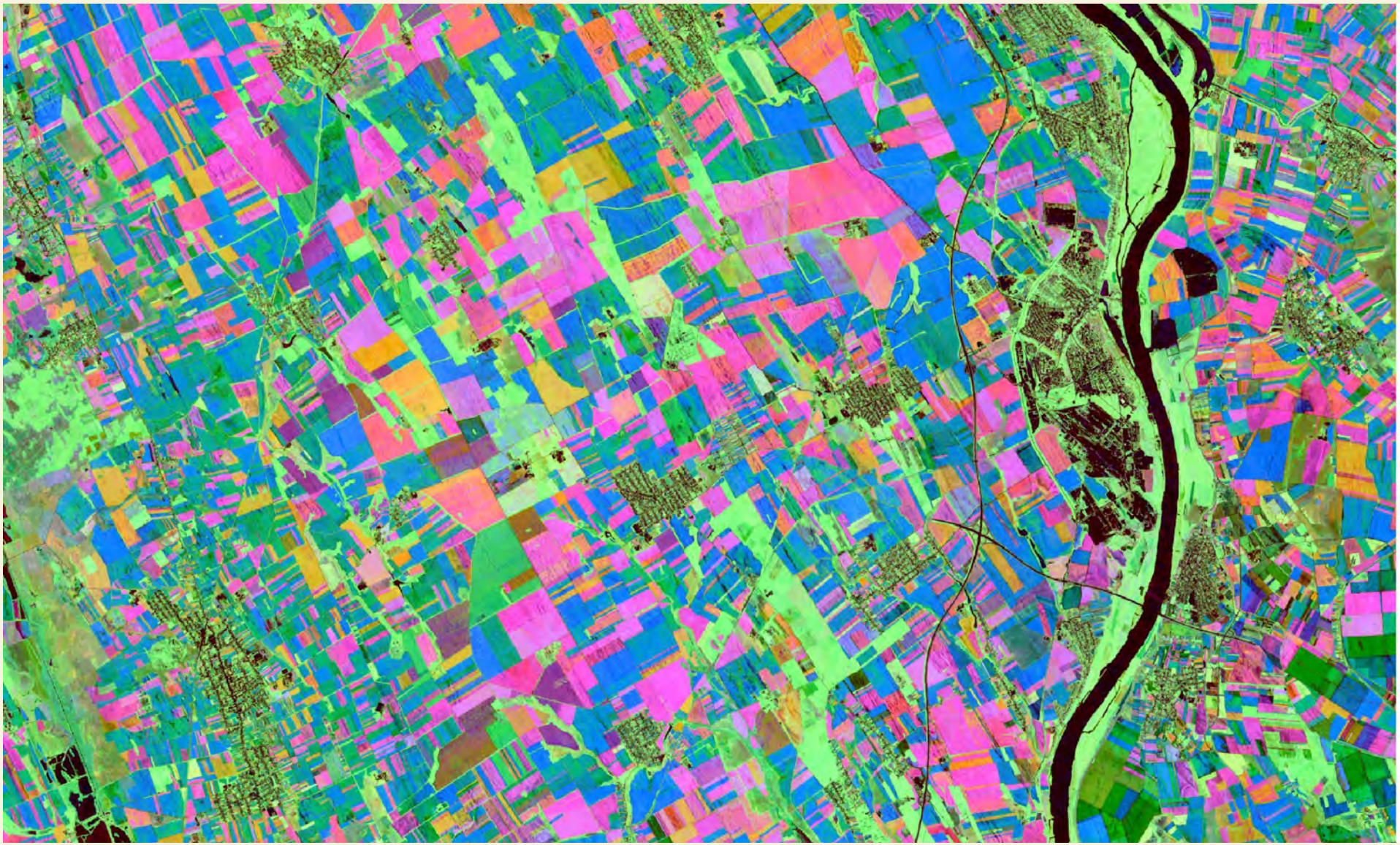
DIGITAL EARTH AUSTRALIA

https://www.dea.ga.gov.au/



MONTHLY NDVI STATISTICS ON COUNTRY LEVEL

- Vegetation statistics
- ~9 months woth of Sentinel-2 data
- 2 Countries and 2 US States



COMMUNITY

2021

Join OSGeo as Community Project

HOW TO DIVE IN?

- www.opendatacube.org
- www.github.com/opendatacube (Source Code)

Some of the Sandboxes

- https://www.dea.ga.gov.au/
- www.digitalearthafrica.org
- https://www.openearthalliance.org/sandbox