Digital Earth
AFRICA

Digital Earth Africa NOR sponsorship Final report

Dec 2023

The Digital Earth Africa Vision

To provide a routine, reliable and operational service, using Earth observations to deliver decision-ready products enabling policy makers, scientists, the private sector and civil society to address social, environmental and economic changes on the continent and develop an ecosystem for innovation across sectors

Open and Free Data
- Interoperability
- Privacy and Integrity

Operational Service
- Continental-scale
- Sustainable
- Domain expertise

Accountability and transparency
- Responsive to African priorities
- Agile, nimble and actions oriented

Diversity and inclusion
- Multi-sector perspectives
- Span data communities
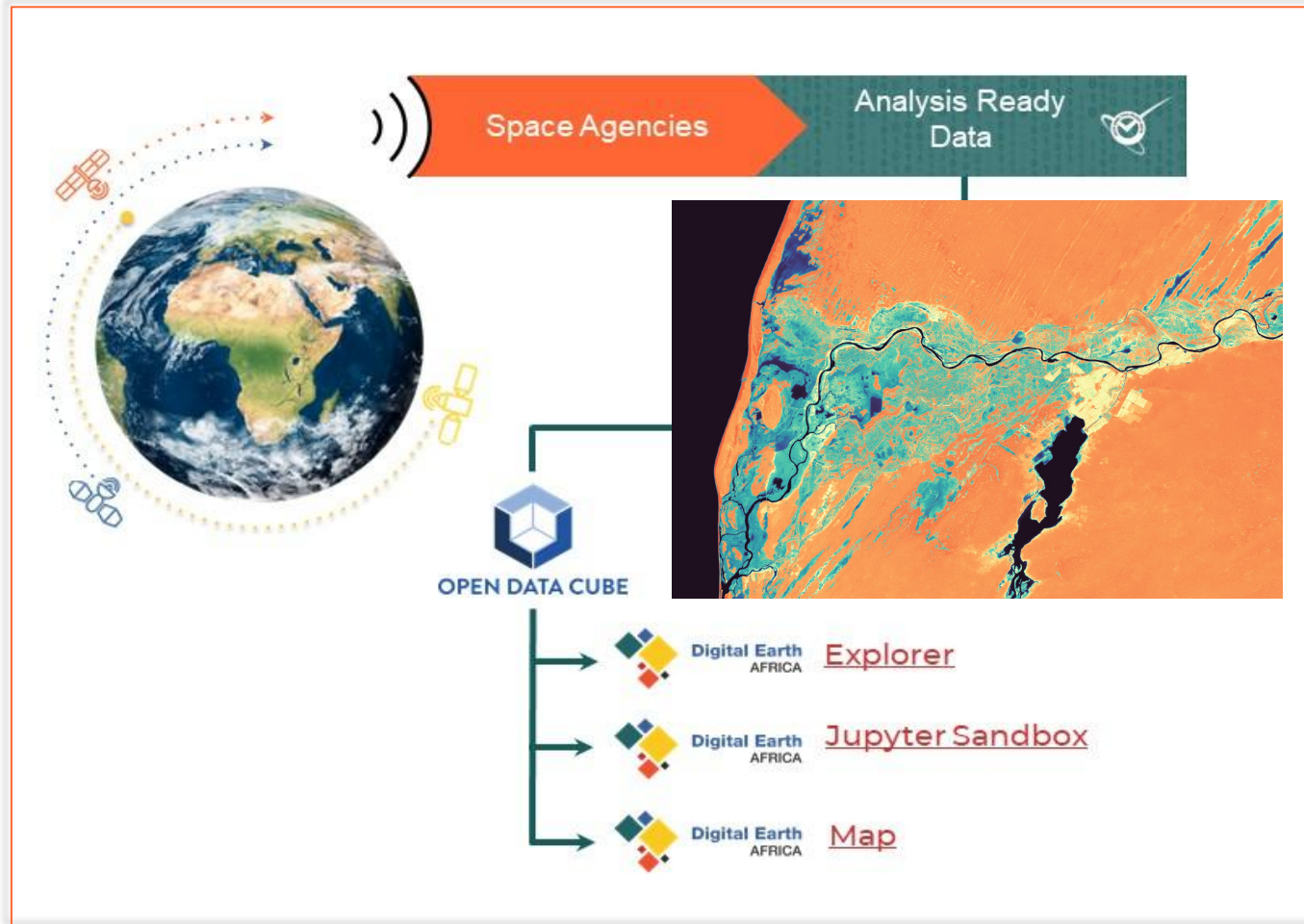- Foster collaboration

Land degradation

Coastline changes

Urbanisation

Water resources and flood risks

Agriculture and food security

Analysis Ready Data, Decision Ready Products

- Largest global Open Data Cube implementation; entirely cloud native
- Continental scale, high resolution satellite data
- Free, even for commercial use, with optimized EO data for web processing
- Co-designed continental scale services with complete visibility from the data to the product
- Extensive library of analysis tools and training materials to support climate action
- Different interfaces for different needs, free online learning platform, helpdesk

Digital Earth Africa

NOR Project Objective

Facilitate complementary data access for DE Africa users seeking higher-resolution mapping solutions

Test use of high resolution imagery for mapping small crop fields

Outcome - Python notebooks

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Jupyter Python Notebooks that can be used to order and load commercial imagery through Sentinel Hub.

https://github.com/digitalearthafrica/commercial-data-via-sentinelhub

> 📄 1_commercial_data_SentinelHub_order.ipynb
>
> 📄 2_commercial_data_SentinelHub_load.ipynb

Notebook #1 allows users to interactively define an area of interest, check data availability through various commercial datasets supported by Sentinel Hub, and visualize thumbnails before making an order.
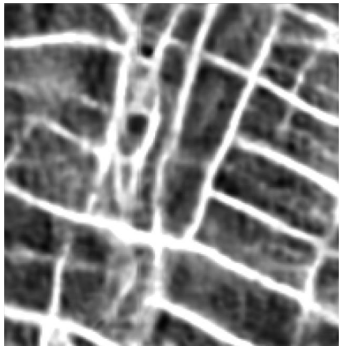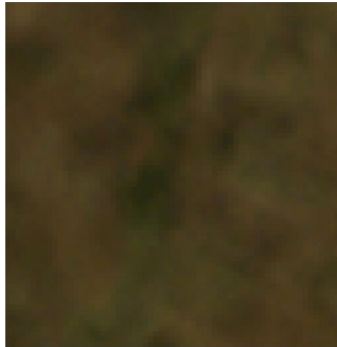
Notebook #2 allows users to query and load commercial data into a Python xarray. This method is similar to the Open Data Cube (ODC) API's data loading procedure, providing a familiar interface for analysis in the DE Africa Sandbox.

Value of high res images and challenges
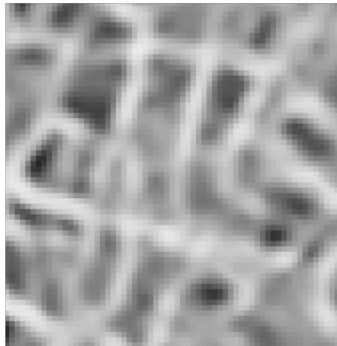

Pan-sharpened SPOT RGB

Planet RGB mosaic

SPOT-derived field boundary probability

Planet-derived field boundary probability

Very high spatial resolution (sub-meter to meter) images are powerful for mapping small agricultural fields

See also Wang, S., Waldner, F., and Lobell, D. B. 2022 (https://doi.org/10.3390/rs14225738)

Challenges for adoption at scale

- **Temporal revisit and cloud impact**
- **Manual selection**
- **Irregular scene/image grid**
- **Cost and license restrictions**

Summary

The NOR project allowed us to

- **access high resolution imagery through cloud**
- **develop tools for accessing high resolution imagery through a Python interface familiar to our users**

DE Africa will continue to focus on user engagement and support development of interoperable analysis ready data