DEAfrica Platform

- DE Africa Map - http://maps.digitalearth.africa/
- OGC Web Services - https://ows.digitalearth.africa/
- Explorer - http://explorer.digitalearth.africa/
- Public Data bucket - https://data.digitalearth.africa/
- Jupyter Hub - https://sandbox.digitalearth.africa/
- GitHub - https://github.com/digitalearthafrica
- Slack channel - #de-Africa https://opendatacube.slack.com/
- Esri Africa GeoPortal
DEAfrica Data – Landsat Imagery

Landsat 5, 7 and 8 Surface Reflectance (USGS collection 1)
Thanks to the CEOS African Regional Data Cube team

~ 60,000 scenes, ~ 10% of the continent
DEAfrica Example Products – from Data to Information

Water Observation from Space Classifications
DEAfrica Example Products – Summary Statistics

Water Observation from Space Classifications

Annual Water Observation Summaries
DEAfrica Example Products – Vegetation Status
DEAfrica Example Products – Fractional Cover

Green Vegetation
Non-Green Vegetation
Bare Soil

Namibia
DEAfrica - Data Processing in the Cloud

Pipeline for generating derived products

Data Provider → Object Store → Job Queue → Compute Cluster → Metadata Database
DEAfrica – Cost Effective Processing

From 1 July

Scalable object storage

Processing jobs use up to 30 Nodes, 480 CPU Cores and 16,320 GiB of Memory

Data processing cost of ~ USD 200 (using AWS Spot)
Countries covered:
- Kenya
- Senegal
- Sierra Leone
- Ghana
- Tanzania
- Rwanda
- Burundi
- Cape Verde
- The Gambia
- Togo
- Guinea-Bissau

DEAfrica Explorer - http://explorer.digitalearth.africa/
DEAfrica Web Map  http://maps.digitalearth.africa/

OGC Web Services
Hands-on Exploration in the Jupyter Hub -
https://sandbox.digitalearth.africa/
Digital Earth Africa Demo - Crop Growing Trend

This notebook gives an example of using DEAfrica products to identify likely irrigated crops and plot growth trend over multiple years.

Two products derived from Landsat Surface Reflectance data are used:

1. NDVI derived from Landsat Surface Reflectance.
2. Fractional Cover.

Following steps are demonstrated:

1. Find a clear Landsat 8 image during the dry season and visualize
2. Segment the clear image using NDVI values
3. Select a segment and retrieve the fractional cover time series

1. Find a clear Landsat 8 image during the dry season and visualize

```python
import matplotlib.pyplot as plt
import xarray as xr

# Import datacube modules
import datacube
```
More examples
Next to come

- Digital Elevation Models
- ALOS JESR, PALSAR and PALSAR2 Mosaics (radar)
- USGS Collection 2 Landsat Surface Reflectance

- All at continental scale
Esri Africa GeoPortal
http://www.africageoportal.com/

Guenter Doerffel
Esri – Global Imagery Team
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Digital Earth Africa Landsat 5/7/8 Change Detection

About this sample App
This compilation accesses the Landsat data of the Digital Earth Africa announced on DE Africa day (12th of August 2019) in Nairobi.

Based on the 3 'evolutionary generations' of Landsat you can select 2 images you regard appropriate (choose cloudless images where available) and then apply some simple change detection algorithms to it.

Use the swipe tool to compare

Here a hint for a nicely working combination:
Use the bookmark tool and go to Nairobi (Detail)
Open the ChangeDetection Tool
Select the Landsat 8 collection
Set Date 1 to be December 28, 2017
Set Date 2 to be February 3, 2014
Select the "Built up index" option (this will work with Landsat 8 only because of the bands used for it)
Select the "Difference Mask" Option
APPLY

The areas in GREEN will show increase in Built-Up areas clearly

Credits to Digital Earth Africa
About this little App
This app loads the wofs layer of the DE Africa data cube - but filters display to pixels classified as water

This mask exists for any single tile. There is also a summary layer in DE Africa, but not available here.

How to use this app
To make use of this data within the App, select the same time for both the Landsat 5 Layer and the Mask Layer

Example comparison:
FIRST load April 7th 1991 for both layers: The delta shows quite some flooding
SECOND load April 2nd 1995 for both layers: That year, it was dry around the same time of the year

Choosing many other dates will show 'patchy' water layers - as an effect of clouds at exposure time. This shows the value of time series!

Bitwise information like this is really only valid at full resolution on the original pixel. Therefor, this app only makes sense when zoomed in to detail.
Thank you!