EO4SD WEBINAR SUMMARY

‘How-to’ Session: Using Jupyter Notebook to access EO data (hands on)

This document presents a short summary of and key lessons from the European Space Agency’s Earth Observation for Sustainable Development (EO4SD) Climate Resilience Cluster’s recent webinar **“‘How-to’ Session: Using Jupyter Notebook to access EO data (hands on)”**. The webinar, the final in a series of seven held by the EO4SD Climate Resilience Cluster in June and July 2020, consisted of a hands-on session and guided tutorial in which participants were familiarised with the user interface of the dedicated data access platform deployed under the ESA EO4SD CR initiative. Additionally, participants gained knowledge about the types of EO-based climate data available through the platform.

STEPHANO NATALI

Space Business Manager, SISTEMA

Stefano presented the origin of the EO4SD CR platform and explained how the platform allows you to analyse data with a long-time series at a global level, as well as simulations and projections, along with a lot of other products from Earth Observattions. One of the main issues is knowing how to navigate the large variety of data available. Therefore the platform summarises information for the user, not only to give access to the data, but to make it accessible. The EO4SD CR platform has been specially adapted to provide International Financial Institutions’ (IFIs) regional and global programmes with enhanced climate risk management capabilities. Through this one, easy-to-use platform, a multitude of data sets can be accessed and outputs and visualisations tailored for the uses that the IFI needs them for.

DORRA PERROU

Research Associate, NOA

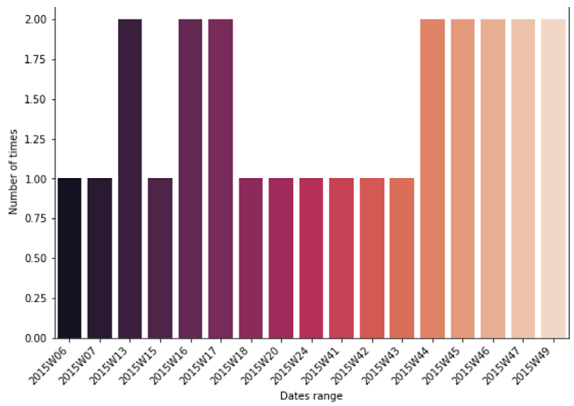
Dora then explained that the Jupyter Notebook is a very powerful tool for interactively developing and presenting data science projects. Programming takes place in the web browser, and allows users to author notebook documents, such as plots, images, and videos, which can then easily be shared with others. She then walked through how to author different documents and how to navigate the pages where the Jupyter Notebook has been incorporated into the EO4SD CR platform.

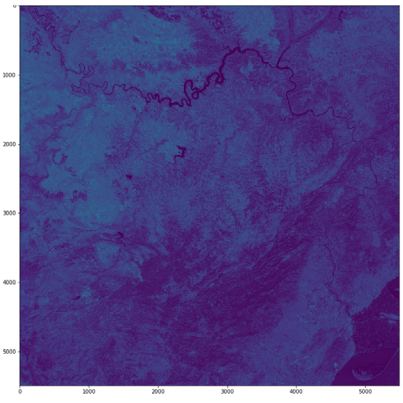
```
In [4]: import mgrs

In [5]: #we should define a latitude and longitude (this is Nairobi's centroid coordinates)
        latitude = 41.28
        longitude = 0.57

        #then we initialize mgrs
        m = mgrs.MGRS()
        #and pass the coordinates as arguments
        c = m.toMGRS(latitude, longitude)
        #since the response is a byte object, we need to decode it into a string
        c = c.decode("utf-8")
        #We finally add the 'T' and select only the first 5 characters so it matches the WCS format
        tiles = 'T'+c[:5]
        tiles

Out[5]: 'T31TBF'
```





Examples of the types of output available from teh platform via Jupyter Notebook. Clockwise from top left: Example data input; RGB map from Sentinel 2 Data; Number of precipitation events as a bar chart.

Anestis then provided hands-on guidance for using the EO4SD CR Jupyter Notebook. His first example demonstrated the total dataset available, and showed how to generate usable outputs through simple python coding. The second example walked through how to build the URL, gather data, and plot data for a specific geographical point. The third example then went through the same process again but for a polygon, which allows you to gather information on a larger geographical area and also map it graphically. These outputs are then easy to copy into other reports as they can be produced as a .png file. Anestis then also showed how to generate a timeseries analysis of temperature from the pre-existing examples available on the platform, as well as how to build 'ad-hoc' examples.

ANESTIS TRYPITSIDIS

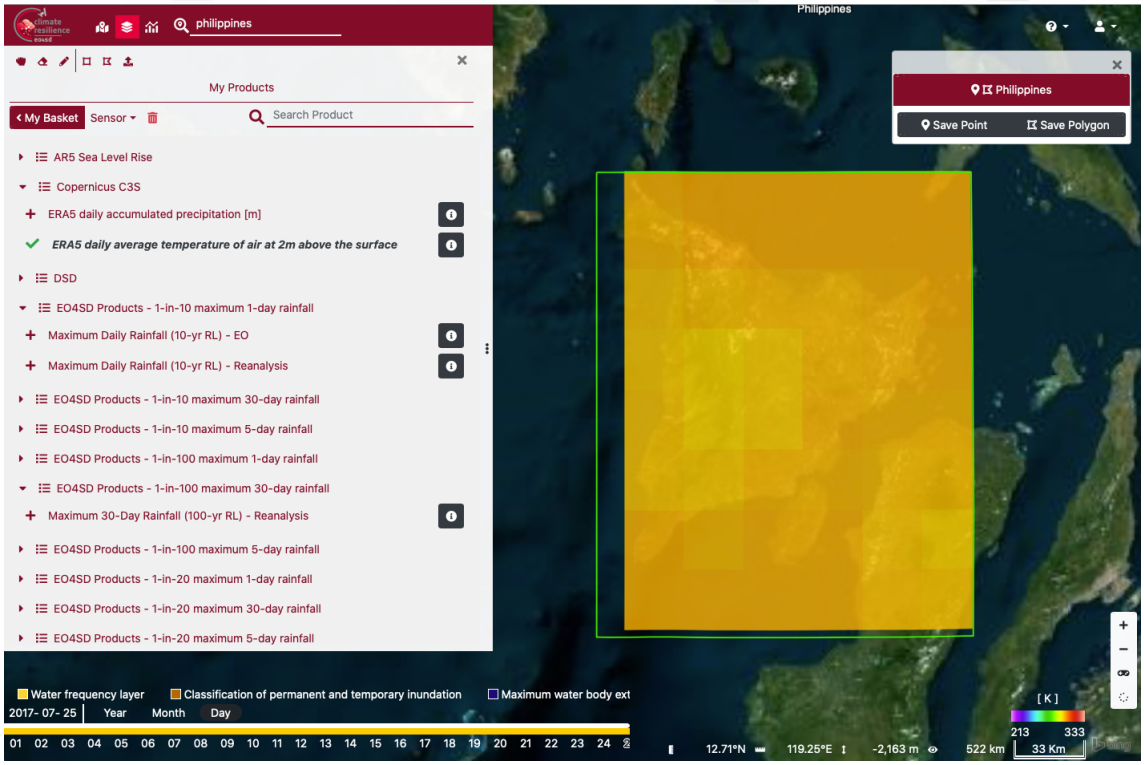
Research Associate, NOA

RESOURCES

Further Reading:

- **EO4SD CR Capacity Building Material here.**
- **EO4SD CR Platform available here.**

Full webinar recording available here.



Screenshot of the EO4SD-CR platform explorer, showign the different data sets available.

Key Takeaways

- The EO4SD CR Platform provides an access to a range of data sets via an easy to use interface. The outputs are also easy to incorporate into other documents and share with colleagues.
- Accessing the Jupyter Notebook via the EO4SD CR platform is also easy to do and is done entirely through a web browser.
- You can define the time range, latitude and longitude for a point, or area for a polygon, and the data set, as well as how this output is displayed - as raw data or in a graphical form.

"The concept that is behind this platform is that you can have a single location in which you can collect all the different data sources".

- Stefano Natali,
Space Business Manager, SISTEMA