



Training for AfriGEOSS Symposium 2017

Sentinel Data Access and Processing

Mission report
Memo

Reference VT-P282-MEM-001-E
issue 1 revision 2
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Memo

<u>Project number</u>	: P282	Training for AfriGEOSS Symposium 2017
<u>Subject</u>	: Mission report	
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1 Contents of the training

The contents of the training have been finalized in collaboration with Andiswa MLISA two weeks before the training and has been edited in the French and English versions.

This training has been organised in five (5) sessions of increasing complexity:

- Session 1 - Discovering Envisat data with HEDAVI
Dealing with heritage data (Envisat MERIS, ASAR and ERS SAR) through the HEDAVI client/server application with its simple IHM and in particular “Basic finder” to retrieve / select / display data.
- Session 2 - Discovering Sentinel data with VtWeb
Explaining the Copernicus programme and its Sentinel component. Using VtWeb to get S1, S2 and S3 data acquired over Ghana and performing basic image processing functions.
- Session 3 - Thematic studies
Dealing with more sophisticated functions of VtWeb to change the style parameters and to create his/here own style. Explaining how spectral bands may be used to discriminate minerals of a surface mine in Ghana.
- Session 4 - Using SNAP
Using the virtual machines to compute an interferogram.
- Session 5 - Using Google Earth Engine
Using GEE to compute the NDVI differences between two dates.

Course and supports have been given in both languages: English and French (oral on demand).



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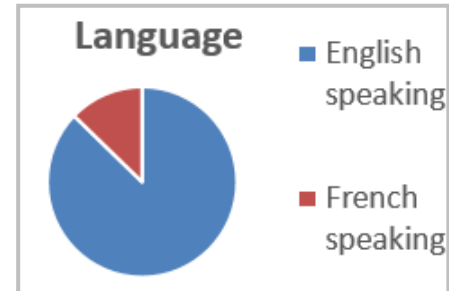
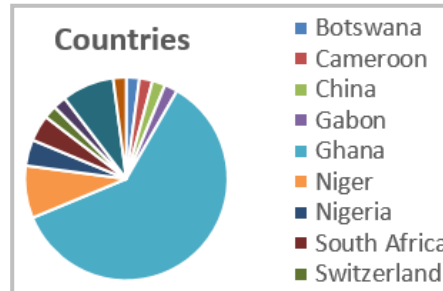
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<u>Sunday 11 June 2017</u>	<u>Monday 12 June 2017</u>
14:00-16:00 - Session 1 - Discovering Envisat data with HEDAVI	09:00-12:30 - Session 3 - Thematic studies
Users may freely access to the HEDAVI Web platform (http://hedavi.esa.int/) to easily display MERIS (Full Resolution optical) and ASAR (Radar) scenes in their usual Web browser (Mozilla, Chrome, Internet Explorer...).	VtWeb enables to perform on-the-fly processing of data. One will study how to get the best of data by applying some of the principles laid down in the lectures of Pr. Serge RIAZANOFF (see http://www-igm.univ-mlv.fr/~riazano/).
Program: Maps in 2D/3D, basemaps, Galleries, Basic finder, Expert finder	Program: Time series, histogram transforms, filtering, NDI
Requirements: Bandwidth minimum 100 KB/s. PC or smartphone with a Web browser.	Requirements: Bandwidth minimum 100 KB/s. PC or smartphone with a Web browser.
16:30-18:30 - Session 2 - Discovering Sentinel data with VtWeb	14:00-16:00 - Session 4 - Using SNAP
ESA has launched three series of satellites in the framework of the Copernicus program: -Sentinel-1 (S1A and S1B with C-SAR radar instrument), -Sentinel-2 (S2A and S2B with MSI high resolution optical) and -Sentinel-3 (S3A with OLCI+SLSTR optical instrument and SRAL altimeter).	SNAP is the "Sentinel Application Platform" provided by ESA (see http://step.esa.int/main/toolboxes/snap/). It is recommended for trainees who want to perform the exercises on their own computer to install SNAP before the training.
VtWeb (see http://visioterra.net/VtWeb/) enables to get Sentinel but also Landsat data together with many other datasets within whatever area of interest.	Program: Installation and configuration, displaying data, overview of tools.
Program: Maps in 2D/3D, basemaps, Finder, predefined styles, hyperlooks, exports, land use / land cover data, meteorological data, climate data	Requirements: Bandwidth minimum 500 KB/s. PC Intel core i5+, 16 GB RAM, SSD 200 GB minimum.
Requirements: Bandwidth minimum 100 KB/s. PC or smartphone with a Web browser.	16:30-18:30 - Session 5 - Using Google Earth Engine
	Google Earth Engine (see https://earthengine.google.com/) enables users to access EO data and to apply on them algorithms written in JavaScript. This session will introduce base concepts through simple scripts to test normalized difference indices.
	Program: NDI, JavaScript, time-series values, visualization, charts.
	Requirements: Bandwidth minimum 500 KB/s. PC or smartphone.

2 Attendees

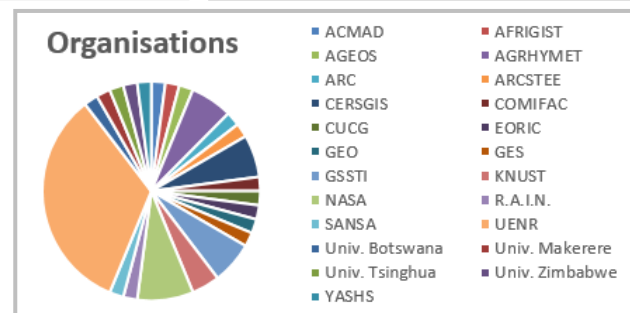
48 persons have attended the training coming from **12 countries** with a strong majority from Ghana (29 attendees).



3 Skills and origin of attendees

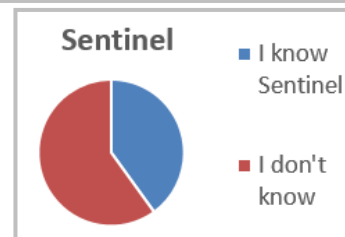
Most of the attendees (16) came from UENR (University of Energy and Natural Resources) hosting the AfriGEOSS Conference. One may also note:

- An important representation of NASA (4) who have trained people about Google Earth Engine in Accra on 7-8 June 2017.
- A representation (3) of a Ghana's private company CERSGIS (Centre for Remote Sensing and Geographic Information Service).



From the survey distributed by Andiswa, 15 people have answered not having knowledge about Sentinel (60%). During the lectures, many attendees have asked for more information about Sentinel data.

Most of the attendees had a high academic level: lecturers, senior analysts, teachers... the lowest ones being the UENR students.



4 Location and logistics

The inventory of the participants' equipment, nor the type of the computers was not part of the expectations of my mission. Nevertheless, from the picture below, it can be seen that:

- the majority of the participants were equipped with a laptop
- almost 1/3 of these computers were Apple and
- from my individual support to the students, no one was using the LINUX operating system.

Unfortunately, nobody was equipped with the 3G USB key I bought in Sunyani city to fight against the deficient, low and intermittent WiFi of the university. The attached figure zooms on this 3G USB key.



5 Feedback of attendees

We haven't performed a survey of satisfaction after the course. Positive feedbacks that have been collected are individual. Next photo has been taken during the Conference three days after the end of the training and many attendees were missing.



6 Distributed material

The 30 4-GB USB keys (pen drives) provided by ESA have been distributed to the attendees with the PDF version of my lecture support.

7 Concluding remarks

7.1 VtWeb + 3G USB key

VtWeb is the lightest way to do some image processing in countries with low Internet access. One recommendation to equip students with 3G USB keys with a minimum of 2GB short-term subscription for the time of the training.

7.2 SNAP + VM

Use of V.M. has been difficult because we spent a lot of time to explain the attendees how to get the ZIP files that were installed in a very remote directory and to copy this file in a directory where the extraction has been possible because of the writing rights.

Use of SNAP is very delicate and the system may often block when the instructions of the course support are not strictly applied.



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7.3 GEE

It is not possible to train people to JavaScript in a too short time. Even the four NASA colleagues have just presented the techniques in a fully passive way (no practical exercises) during their 2-days sessions few days before in Accra.