Assignment 5 : Google Earth Engine

Goal: The overall goal of assignment 5 is to do your own an analysis of an earth observation data set using the Google Earth Engine (GEE) and create a visualisation similar to the visualisations on NASA's "image of the day". You are free to select a 'topic of your choice' that you analyse by means of an earth observation or climate data set of your choice (e.g. natural hazard, natural phenomena, human impact, etc).

Task: Write a short report (max. 4 pages per assignment) that is targeted towards a wider public (check examples on NASA's "image of the day") accompanied by the documented code (i.e. source code accompanied by comments in order to make it self-explanatory) to preprocess, visualise, export and analyse your GEE data set of your choice and analyse this data.

Background: check introduction slides and the corresponding links.

Steps to incorporate:

- formulate a topic that you want (and can) analyse (you can look for inspiration on NASA's "image of the day" or)
- select two data/image collections from any GEE imagery data set of your choice that can help you to visualise/analyze your topic (e.g. combination of high and low spatial resolution satellite data (Sentinel-2 vs. MODIS); combination of optical and radar satellite data (Sentinel-2 vs. Sentinel-1); combination of satellite data with climate data, etc.).
- preprocess your data in a jupyter notebook using the geemap package or using the GEE javascript interface online:
    - filter your data set (e.g., based on region, date, meta-data, etc)
    - map a function on your data set (e.g., for preprocessing and removal of clouds, for index calculation, etc.)
    - implement a GEE reducer
- visualise the result of your preprocessing in the GEE Map browser using the guidelines explained in the introduction session.
- export the result of your preprocessing as geotiff and visualize externally (e.g. in QGIS, Matlab, ...). Examples of how to do this will be given in the 2nd session.
- design your visualisation to maximize your story (e.g. by adding before/after images or including time series; by adding appropriate scale bars, labels, annotations, etc)
- write a short report targeted towards the wider public similar to the posts NASA's "image of the day". This report should contain both (short) information on the topic you describe as on the data sets (and steps you included) to analyze this topic

If you are going to (re-)submit, make sure to submit ALL items at the same time. Resubmitting will overwrite all previous submissions.