Google Earth Engine and Google Cloud platform for detection and mapping of peatlands. A workflow example in Scotland.

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Supercomputers and high-performance computing systems are becoming widely available, as well as very large data-set. The aim of this work is to show an example of a workflow to use Google Earth Engine with open source tools (such as R and GRASS GIS) for spatial data analysis. The application described is detection and mapping of peatland. The test area is Scotland (UK, ' 78; 000km2, excluding the Shetland islands) because of the availability of ground data. This is a typical application in the environmental science. Despite the relatively small test area, the management and processing of time series of Sentinel 1 data is often beyond what a normal workstation can achieve. The data analysis of such amount of data require also a dedicated processing facilities, especially when considering the production of the final predicted surface at a resolution of 100m or 10m. The developed workflow can then be applied to larger areas. The use of Google Earth Engine greatly facilitated the data access and pre-processing. However some of the spatial data analysis tools are somehow limited. Therefore the integration with other Google Cloud Platform and open source tools allowed access to a greater variety of methods including deep learning techniques.