

We Value Nature 10-Day Challenge Event

A practical workshop on modelling nature-based solutions for water, 22/03/2021

Session summary & key takeaways

The workshop walked participants through the use of QGIS, the modelling of vegetation density using satellite data and the modelling of overland flow paths using topography.

Open-source satellite data from Sentinel can be used to calculate the Normalised Difference Vegetation Index (NDVI), which can show where there is more or less vegetation in a landscape. The workshop identified the data to use for this, the basic equation to create NDVI and how to calculate this in QGIS.

Simple hydrology can be created from a Digital Elevation Model (DEM) to identify where water will flow across the landscape. The workshop showed which tools within QGIS can achieve this and how to use them with a standard DEM.

Combining the vegetation and hydrological outputs can be powerful in understanding where creating nature-based solutions (NbS) will have most impact on local water problems. This can include reducing flooding, diffuse pollution and erosion by creating/restoring habitats or implementing water retention features. The workshop showed how this can be done with reference to Viridian's HydroloGIS modelling.

Key takeaways:

1. Useful NDVI and hydrology can be created simply using open-source data in QGIS.
2. These methods can be applied globally, although better DEM data will give better hydrological results in some countries.
3. More detailed analyses are required to fully characterise landscapes and identify the most effective NbS to water problems.

Warm thanks to Leon Baruah, Technical Director of Viridian Logic for the insights he shared.

Key solutions presented / actions to take

Participants learnt how to use QGIS to create simple NDVI and hydrology. This knowledge can be used to experiment with other parts of the satellite data to create a plant health index. They can then combined this with the flow accumulation layer and base maps to identify problem areas and solution opportunities within the landscape.

Useful open-source data resources

1. Copernicus open access hub [Open Access Hub \(copernicus.eu\)](https://openaccess.copernicus.eu/)
2. Landviewer portal [Land Viewer | EOS](https://landviewer.eos.com/)
3. Earth Explorer portal [EarthExplorer \(usgs.gov\)](https://earthexplorer.usgs.gov/)
4. 25m DEM [EU-DEM v1.1 — Copernicus Land Monitoring Service](https://landmonitoring.copernicus.eu/)