

A peak through the clouds

Seeing Ireland with Radar



Despite the surge in freely available satellite imagery, especially from ESA (Sentinel programme) and NASA (LandSat programme), remote sensing in Ireland can be both difficult and frustrating. The main reason is cloud cover. Ireland is famous for its rainy weather, and even on dry days a perfectly clear sky is a rare occurrence. This significantly impacts the availability of optical imagery, limiting our availability to create annual time series to look at changes.

One way around this are active radar satellites which send out microwaves and record the backscatter. One such satellite mission is ESA's Sentinel 1 mission which uses a technique called Synthetic Aperture Radar (SAR) to take regular images of the Earth surface. Radar waves can penetrate cloud cover, offering acquisitions where optical satellite will only see the top of the clouds.

This month's map shows a composite image of all acquisitions by the two Sentinel 1 satellites in the month of November 2020. The brightness of the pixel reflects the amount of the signal returned to the sensor. Usually, rougher surfaces scatter a larger proportion of the signal away from the sensor. The exception is water, where the majority gets reflected away from the sensor due to the angle of the sensor (water bodies are darkest on the map). Urban areas with smooth angled surfaces usually return the largest proportion of the signal. The colour in the map is generated from the two bands of signal backscatter which reflect the polarisation relative to the emitted signal (VV – vertical emission, vertical back scatter, and VH vertical emission, horizontal backscatter). Larger shifts in the colour show the different images used to compose the final composite.

Projection: Irish Transverse Mercator

Datasets used:
ESA Sentinel 1 acquired from CNES PEPS repository

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