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Over 800 Irish lakes monitored from space

Els Knaeps, Robrecht Moelans, Sindy Sterckx, and Liesbeth De Keukelaere
VITO, Remote sensing, Mol, Belgium (els.knaeps@vito.be)

We have monitored more than 800 Irish lakes from space for the first time using satellites. Until now, only about a quarter of these have been actively monitored, using water samples collected from a boat and bringing it back to a laboratory for analysis. The new technology will not entirely replace the traditional methods nor fulfil the Water Framework Directive's requirements for ecological assessment, but should help to provide estimates of water quality of unmonitored lakes, improving catchment risk assessment and give a more holistic national estimate of lake quality.

The MSI sensor onboard the Sentinel 2 mission captures images of Ireland every two to three days and with a spatial resolution of 10 to 20 m they are ideal to cover most of the large lakes in Ireland. In total 63 tiles of Sentinel-2, with a size of 100 by 100 km, have been processed to cover the summer of 2016, 2017 and 2018. The images were corrected for atmospheric disturbances using the atmospheric correction software iCOR, they were screened for clouds and all water pixels were identified. The Sentinel-2 images contain information in several narrow spectral bands in the Visible and Near Infrared. This spectral information is extracted for several positions within each lake. This is performed in a smart way such that the locations are far enough from the borders and do not contain any aquatic vegetation, clouds or cloud shadows. By investigating the Sentinel-2 spectral reflectance in the visible and near infrared we can derive information about the macrophytes, or aquatic plants in the lake, which are a key indicator of the water quality. We can also get an indication of the amount of algae in the water by applying a Chlorophyll algorithm. Information from the satellite can also help teams locally detect where there might be pollution issues ongoing and help them direct resources to investigate and find where the source of the pollution is coming from.