

Case Study



The James Hutton Institute



Client:

The James Hutton Institute is a world-leading independent scientific research organisation based in Scotland working in collaboration on projects with partners across the globe.



Industry:

Scientific research

Product:

Aerial Photography

“We have annotated 20 km² of high-resolution aerial images from Bluesky’s Aerial Photography and used them to train a model to enable the identification of peatland features like erosion and drainage – both of which are key identifiers for assessing peatland condition and associated emissions. Now we also have access to historic aerial imagery so it is likely we will incorporate this in the future to enable us to capture variations in peatland condition.”

Fraser Macfarlane, Machine Learning Research Scientist at the James Hutton Institute.

Summary:

The team at the James Hutton Institute has been working on a project to create a deep-learning model to map peatland drainage and erosion across Scotland. This is the first large landscape-scale approach to mapping peatland degradation in Scotland and aims to help refine existing national emissions estimates and allow more precise efforts to guide prioritisation of peatland restoration.

Previous work to analyse peatlands to assess the scale of erosion had been carried out using satellite imagery which failed to delineate the erosion features or individual drains.

Challenge:

Previous work to analyse peatlands to assess the scale of erosion has been carried out using satellite imagery. This enabled the confirmation of the presence of erosion and drainage features, both of which are key identifiers of peatland health and show potential emission hotspots. However, the satellite imagery failed to delineate the erosion features or individual drains.

Solution:

Using 25cm resolution aerial imagery from Bluesky allowed the team to detect and delineate at high- resolution, drain features including their dimensions. This in turn enabled the identification of features for restoration which can then be passed on to landowners and managers.

Results:

The new models result in accurate research that can be used to advise on policy and guide investment requirements for peatland restoration projects. There are already a number of clients interested in licensing the model which enable desk-based surveys to be undertaken. Clients include forestry and land owners and managers, peatland specialists, environmental consultants, hydrologists, and soil scientists. The data is

also being integrated into peat condition maps being created by the Institute.

The model is currently focussed on Scottish peatlands but could in the future be rolled out nationally. The team are also now planning on using newly released 12.5cm resolution aerial imagery for future work.

This work has been supported by the Scottish Government’s Strategic Research Programme 2022-27 as part of projects JHI-C3-1, JHI-D3-2, and JHI-D5-2

	Imagery Specification	
Resolution	12.5cm	25cm
Coverage	Great Britain	Great Britain
Accuracy XY	± 30cm rmse	± 60cm rmse
Formats	Include: JPG, TIFF, ECW	Include: JPG, TIFF, ECW
Standard Projection	British National Grid	British National Grid
Tile Size	1km x 1km (8,000 x 8,000 pixels)	1km x 1km (4,000 x 4,000 pixels)
Metadata	Gemini 2.3	Gemini 2.3

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