

Updating an Open Source SDI For Mobile Working.

Progress has little to do with
speed but MUCH to do with
direction.

WARNING:
There's a lot to take in!



Bannau
Brycheiniog





Paul Shapley


shapley


Geo-Technology, Graphic Design,
Cartographics, CGeog (GIS), FRGS


Edit profile

 Brecon Beacons National Park Authority

 Swansea, Brecon

 01:48 (UTC -12:00)

 p.shapley@gmail.com

 <https://www.paulshapley.com>

Who am I?

Take your pick...

Student - Beach Lifeguard -
Chartered Designer - Circuit Board
Inspector - Planning Technician -
Cartographer - GIS Officer -
Chartered Geographer (GIS)

<https://www.paulshapley.com>

2023 – Celebrating 30th Year in Local Gov



Back Story...

- 2013 Foss4g – Nottingham – First QGIS (Cymru) Group Meeting at BBNPA (Brecon). (Shaun Lewis/Kevin Williams)
- 2016 I joined BBNPA from NPTCBC and began to tweak solutions and listen to ‘Users’ requests... half (already) very happy with QGIS. Other half... “why don’t we use ‘Google Earth’ (kml/kmz) for everything”.
- 2018 Introduced ‘ODK Collect’ for digitising suitable walks for people with varying disabilities. The walks were never completed. (ODK was shelved) too complex for volunteers.
- 2020 Pressure to use free ‘arcgisonline’ tools which became standard in the UK National Parks – Same time as ‘Covid’ lockdown made me extremely angry!!
- 2021/2 Started a GIS (Open Source First) Strategy for the Park (didn’t include arcgisonline...) No one complained! Thanks to ‘DataMapWales’ development.

They wanted us to comply with the
'Partnership' rules...

My Esri

Use this self-service portal as your single destination for managing your ArcGIS picks from the ArcGIS suite. Please take advantage of the available help resources and provide feedback so that we can further enhance your experience.

Sign in



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So I decided not to...

**“Further enhance my
experience”**

**I Like ‘Failure’, ‘Success’,
‘Community’,
‘Experimentation’, ‘Problem
Solving and above all...**



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‘CHOICE’

**The 'CHOICE' to 'swap out'
components as technology advances
or project support slows or may even
be discontinued.**



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We needed to collect evidence

My rationale was simple. Evidence must be collected transparently using 'Open Standards' and 'Open Data' (wherever possible) and made available for scrutiny (reproducibility) along with the algorithms used so that we can learn from the process and improve on it in future.

There are many free GI systems and cloud solutions which replicate standard algebra and remote sensing functionalities.

'The Best Solution'

(It's not a big budget problem... It's an 'attitude' problem)



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Decision was to keep development (in-house)

'Consultants' were expensive. They never reveal their methodology and never seem to be available when you have an urgent problem. If you want a 'change' made it's costly and they are more interested in ever bigger contracts and clients. Some ecologists had never used GIS Tools before.

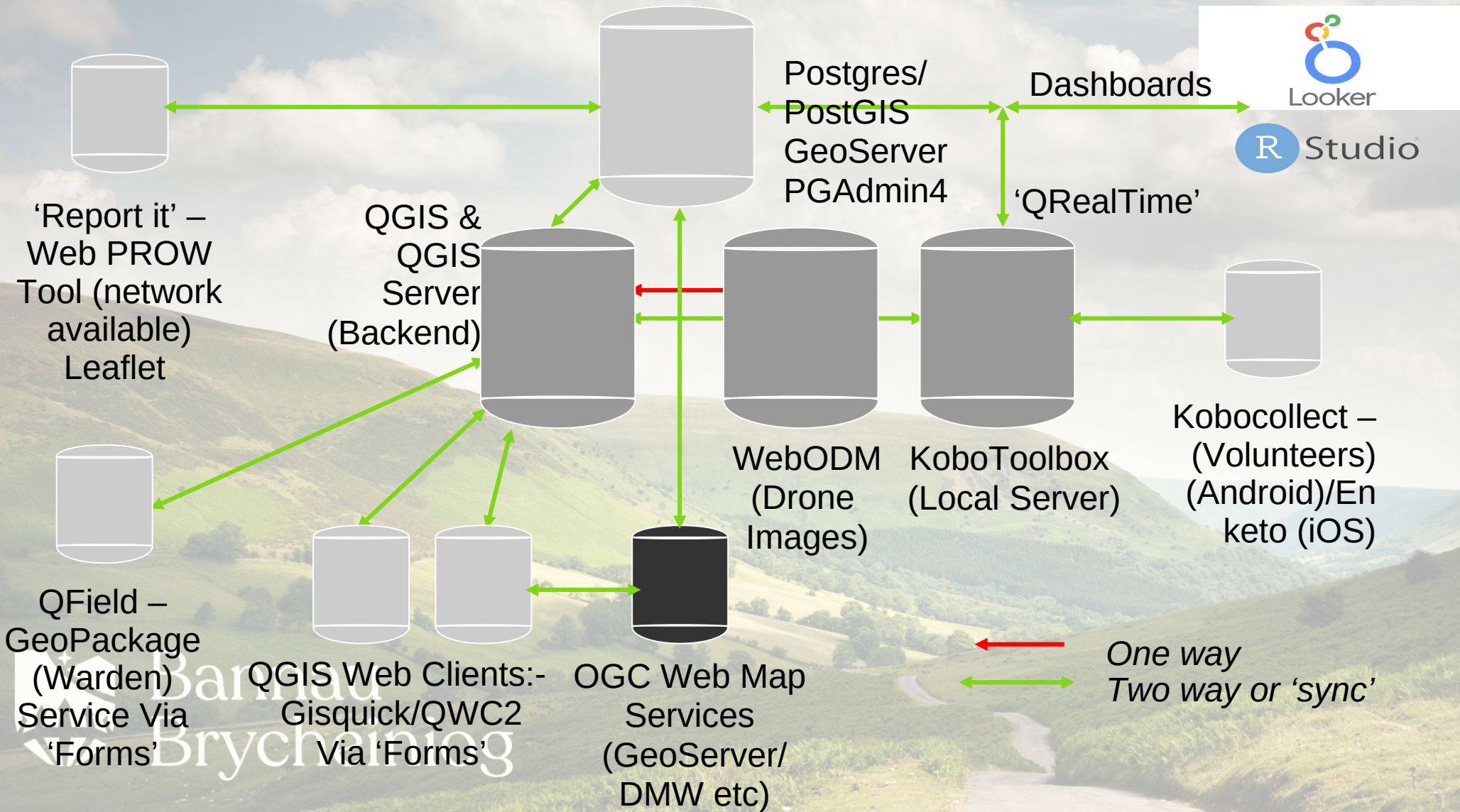
They constantly email you for data and how to do something.

I ended up doing some of the work for them

...how insanely stupid was I??



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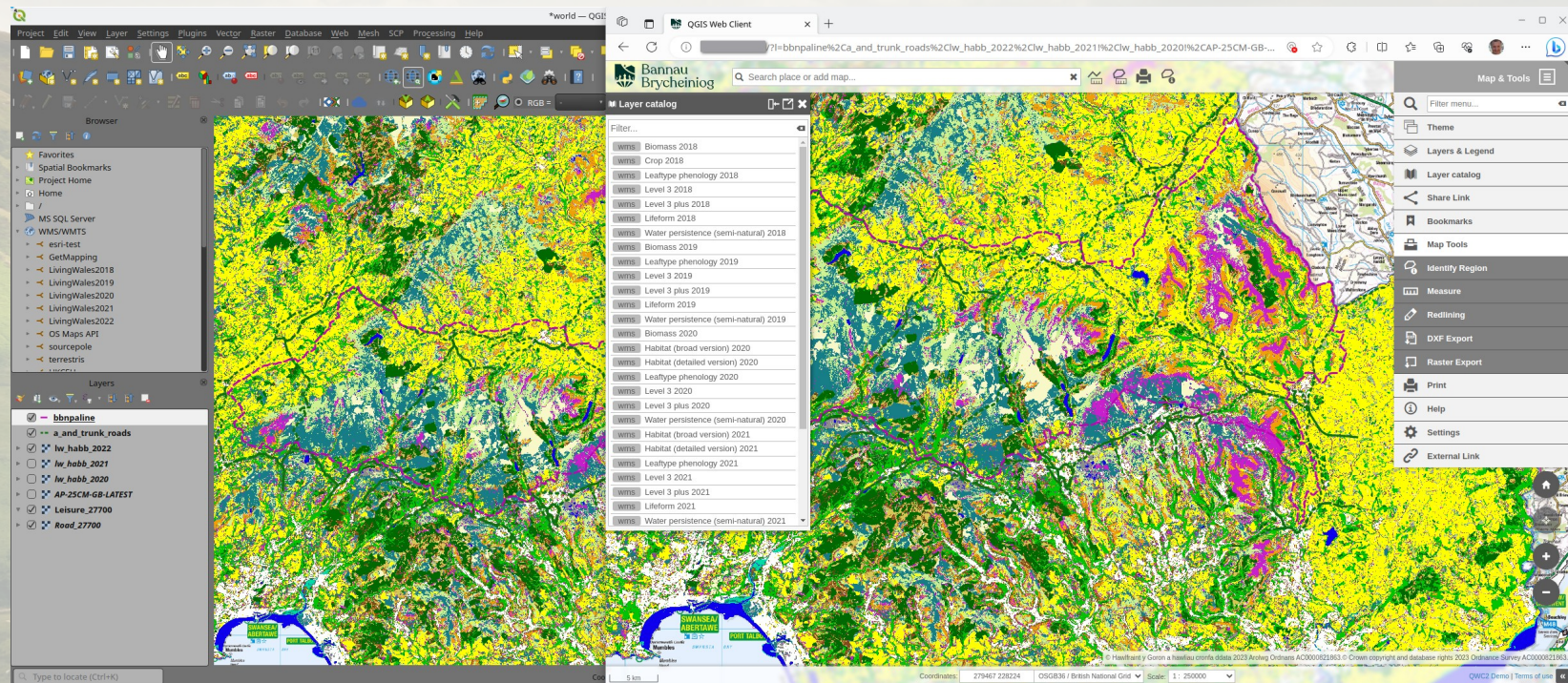


Let's take a closer look at the technologies?

QGIS – The backend 'spatial analysis engine' (no change here)

QGIS Web Client – Taking 'QGIS Projects' to the Web for the 'non-gis' user...

Meaning... you can embed maps in web pages or share and embed maps in social media.



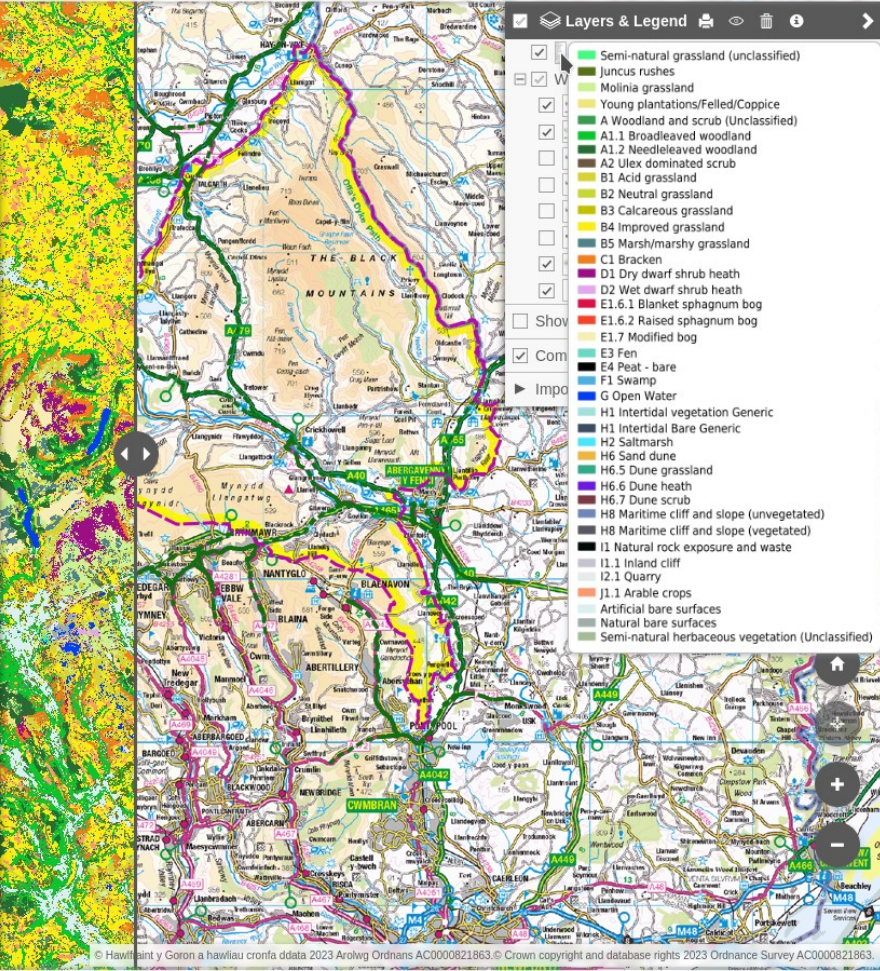
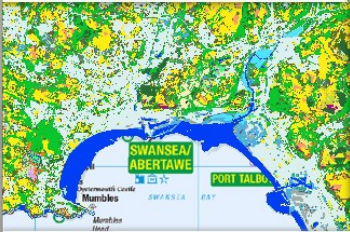
- Layer catalog
- Filter...
- wms Biomass 2018
 - wms Crop 2018
 - wms Leafytype phenology 2018
 - wms Level 3 2018
 - wms Level 3 plus 2018
 - wms Lifeform 2018
 - wms Water persistence (semi-natural) 2018
 - wms Biomass 2019
 - wms Leafytype phenology 2019
 - wms Level 3 2019
 - wms Level 3 plus 2019
 - wms Lifeform 2019
 - wms Water persistence (semi-natural) 2019
 - wms Biomass 2020
 - wms Habitat (broad version) 2020
 - wms Habitat (detailed version) 2020
 - wms Leafytype phenology 2020
 - wms Level 3 2020
 - wms Level 3 plus 2020
 - wms Water persistence (semi-natural) 2020
 - wms Habitat (broad version) 2021
 - wms Habitat (detailed version) 2021
 - wms Leafytype phenology 2021
 - wms Level 3 2021
 - wms Level 3 plus 2021
 - wms Lifeform 2021
 - wms Water persistence (semi-natural) 2021

Layer Info

Habitat (detailed version) 2020

- Semi-natural grassland (unclassified)
- Juncus rushes
- Molinia grassland
- Young plantations/Felled/Coppice
- A Woodland and scrub (Unclassified)
- A1.1 Broadleaved woodland
- A1.2 Needleleaved woodland
- A2 Ulex dominated scrub
- B1 Acid grassland
- B2 Neutral grassland
- B3 Calcareous grassland
- B4 Improved grassland
- B5 Marsh/marshy grassland
- C1 Bracken
- D1 Dry dwarf shrub heath
- D2 Wet dwarf shrub heath
- E1.6.1 Blanket sphagnum bog
- E1.6.2 Raised sphagnum bog
- E1.7 Modified bog
- E3 Fen
- E4 Peat - bare
- F1 Swamp
- G Open Water
- H1 Intertidal vegetation Generic
- H1 Intertidal Bare Generic
- H2 Saltmarsh
- H6 Sand dune
- H6.5 Dune grassland
- H6.6 Dune heath
- H6.7 Dune scrub
- H8 Maritime cliff and slope (unvegetated)
- H8 Maritime cliff and slope (vegetated)
- I1 Natural rock exposure and waste
- I1.1 Inland cliff
- I2.1 Quarry
- J1.1 Arable crops
- Artificial bare surfaces
- Natural bare surfaces
- Semi-natural herbaceous vegetation (Unclassified)

- Layers & Legend
- Semi-natural grassland (unclassified)
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QGIS Server 'Catalogue'

Is a QGIS 'Project'
Viewer. It displays
project files for sharing
online in **QWC2**



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QGIS Server Catalog - Home Page — Mozilla Firefox

QGIS Server Catalog - Home P X +

130.89.6.97/index.html#/

QGIS Server Catalog

OGITO City
OGITO Noise Bochum - City

METADATA BROWSE

OGITO City
OGITO Noise Bochum - City

METADATA BROWSE

Untitled

METADATA BROWSE

Mapping Denai Lama

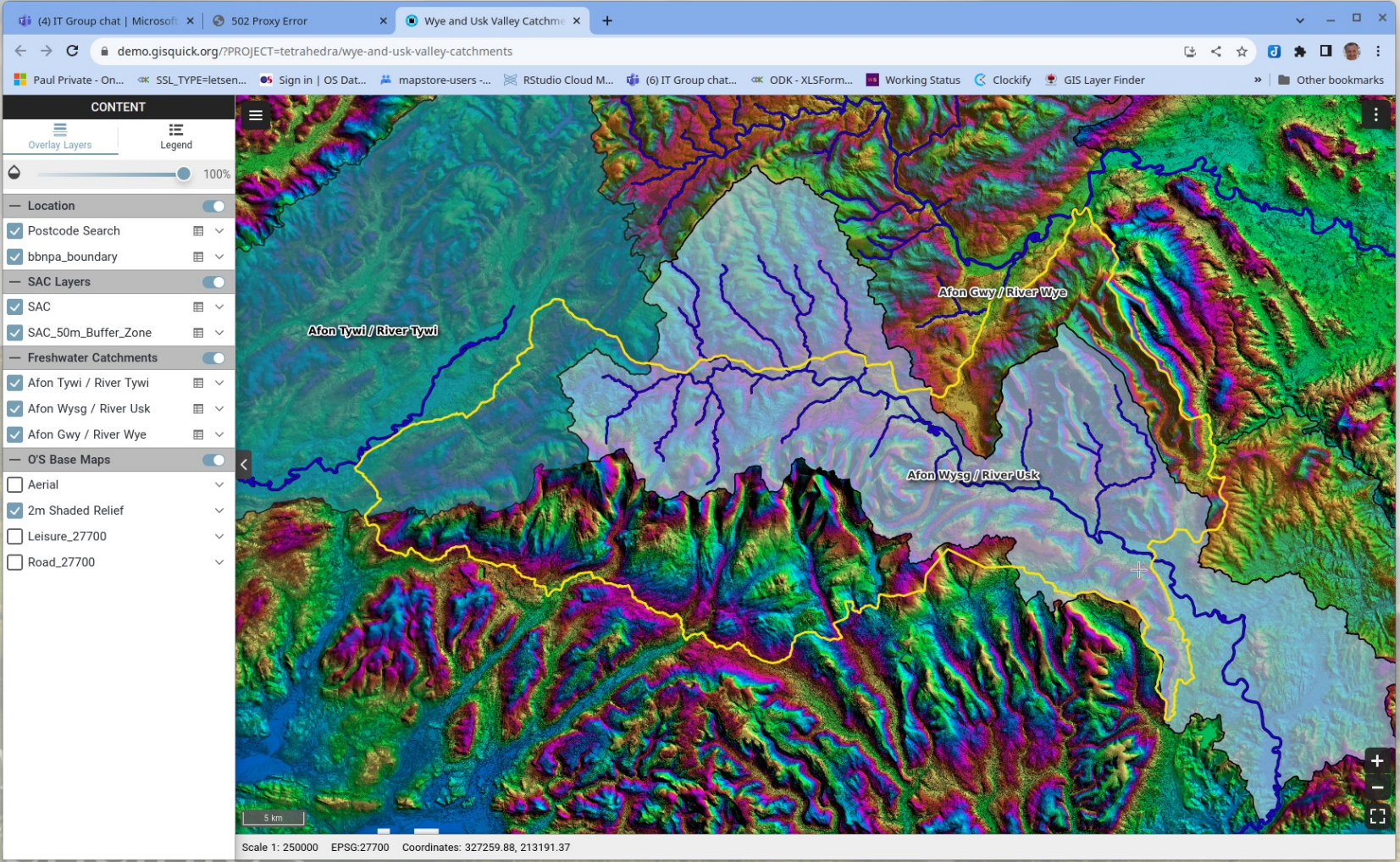
METADATA BROWSE

Mapping Denai Lama

METADATA BROWSE

GECCO

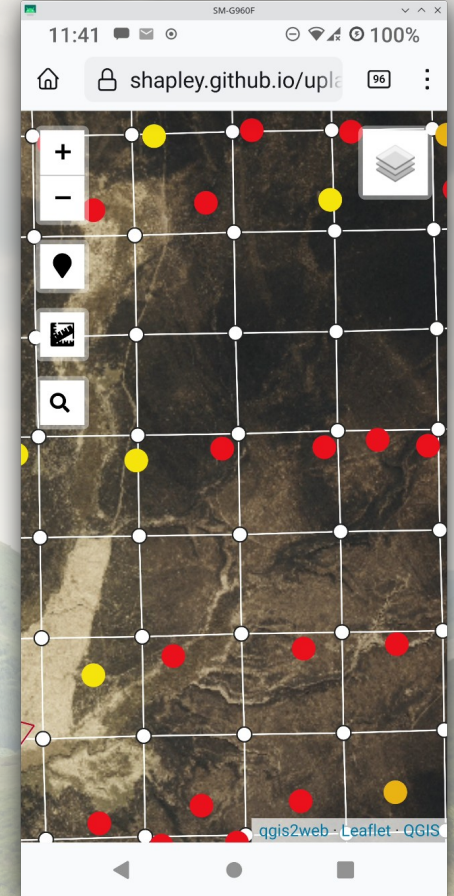
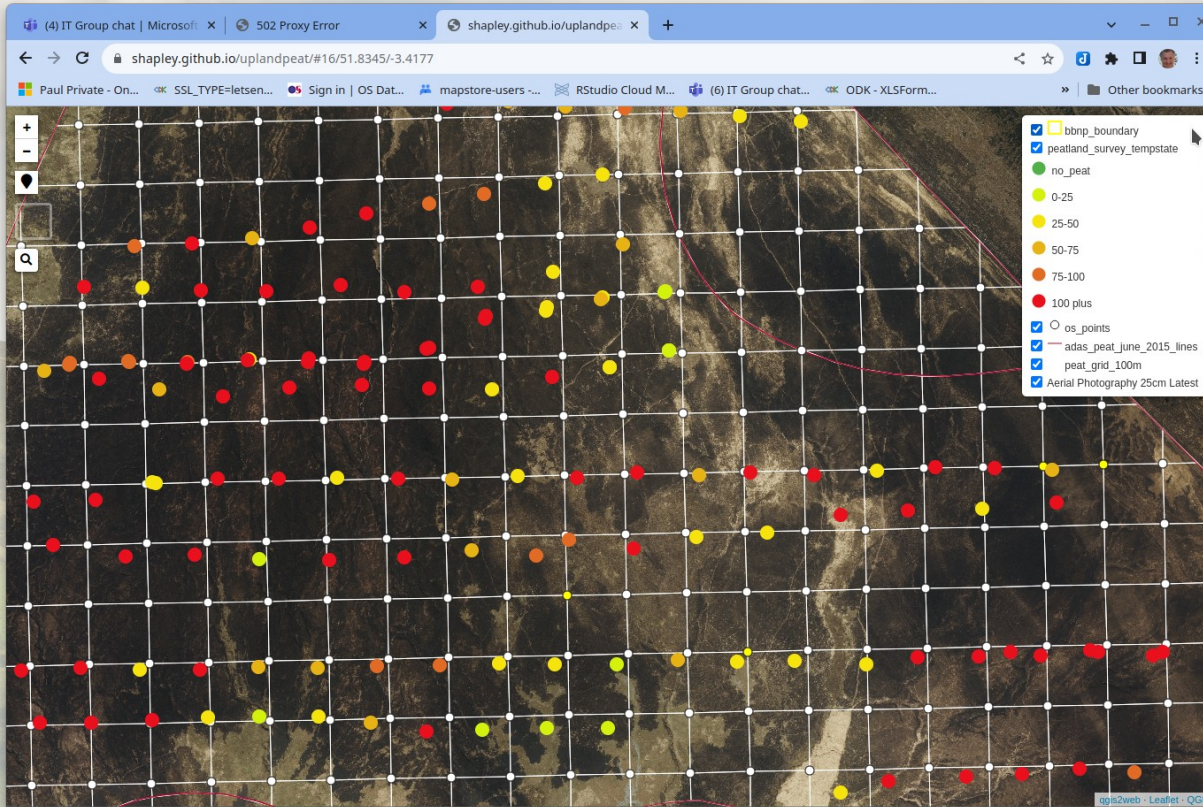
METADATA BROWSE



We've also been testing 'GISQUICK' QGIS Client...I'm very impressed with support.



We've extensively used **QGIS2WEB** QGIS Plugin with Github 'Pages'...It's quick to deploy in less than 30 minutes



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WebODM - OpenDroneMap

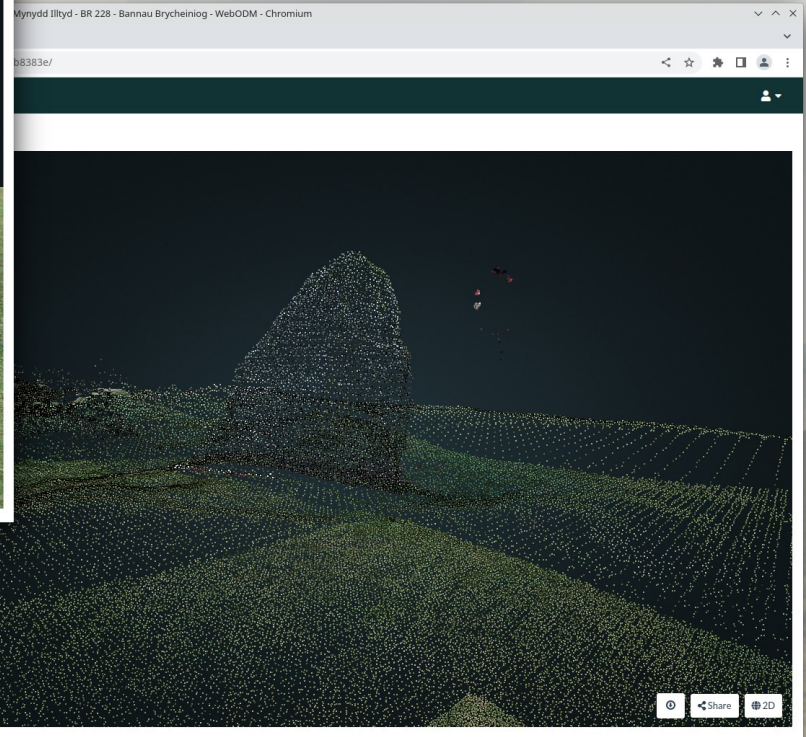
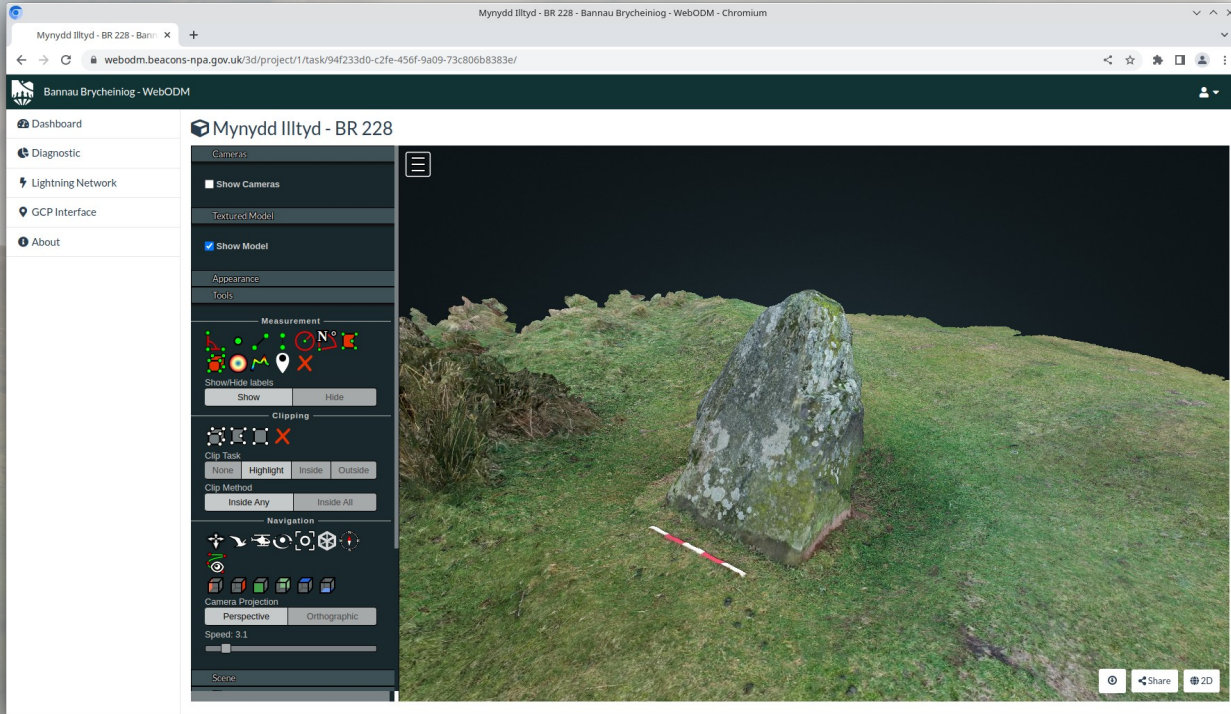
WebODM – Our new drone mapping portal. This portal is two-fold, it stitches the drone images into a mosaic and stores the resulting map and 3D lidar data for measurements and archive either in the portal itself or the resulting map data can be downloaded to use in QGIS.

<https://webodm.beacons-npa.gov.uk/login/>



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WebODM - OpenDroneMap



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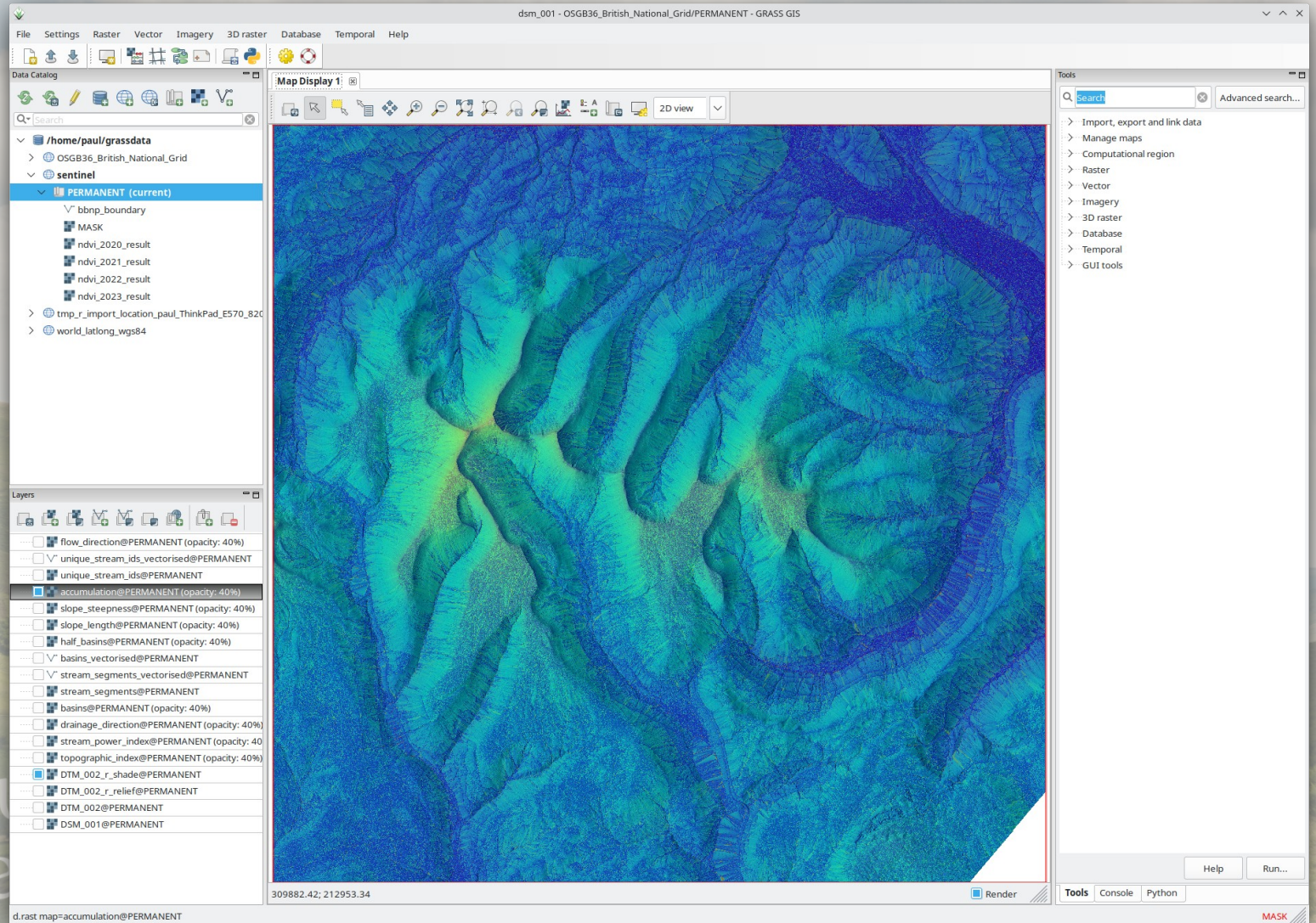
We've looked
at **WebODM**
For the
Monitoring
condition of
monuments



A screenshot of the WebODM web application interface. The browser address bar shows the URL: https://webodm.beacons-npa.gov.uk/3d/project/1/task/94f233d0-c2fe-456f-9a09-73c806b8383e/. The page title is "Mynydd Illtyd - BR 228". On the left is a navigation menu with items: Dashboard, Diagnostic, Lightning Network, GCP Interface, and About. The main content area is titled "Mynydd Illtyd - BR 228" and contains a 3D model of a mossy rock on a grassy hill. A dark sidebar on the left of the 3D view contains various tool panels: Cameras, Textured Model, Show Model (checked), Appearance, Tools, Measurement (with icons for distance, area, volume, etc.), Show/Hide labels (Show/Hide buttons), Clipping (Clip Task: None, Highlight, Inside, Outside; Clip Method: Inside Any, Inside All), Navigation (various navigation icons), Camera Projection (Perspective, Orthographic), and Speed: 2.1. At the bottom right of the 3D view are icons for copyright, share, and 2D toggle.

We also use
The greatest
modular GIS
ever...

GRASS 8



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r.watershed

GRASS 8

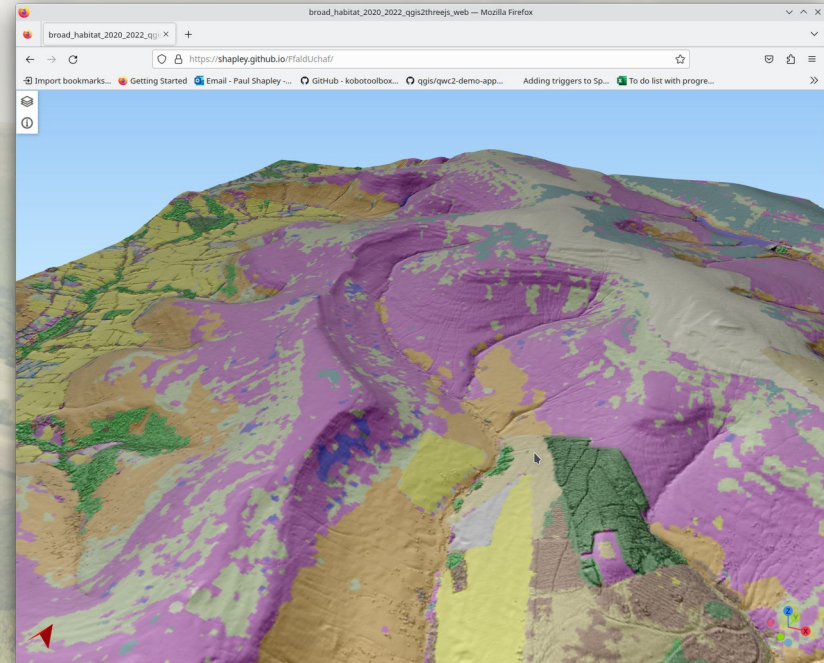
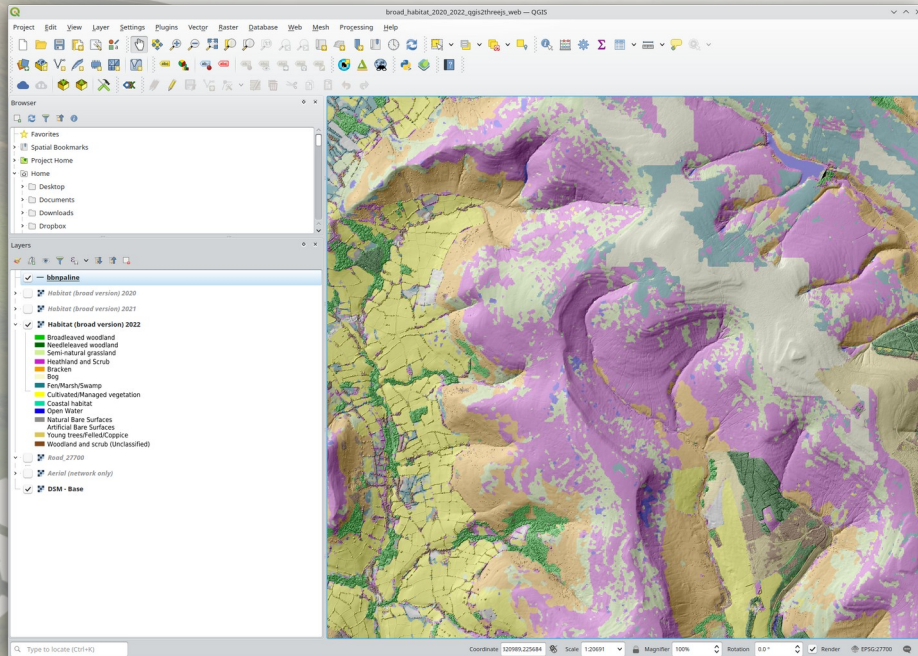
The screenshot displays the GRASS GIS desktop environment. The main window, titled "dsm_001 - OSGB36_British_National_Grid/PERMANENT - GRASS GIS", shows a map display of a watershed. The map uses a color gradient from blue to green to represent different levels of flow accumulation. The interface includes a menu bar (File, Settings, Raster, Vector, Imagery, 3D raster, Database, Temporal, Help), a toolbar, and a Data Catalog on the left. The Data Catalog shows the current workspace at "/home/paul/grassdata" with a project named "sentinel" containing various raster layers. The Layers panel on the left lists several layers, with "accumulation@PERMANENT (opacity: 40%)" selected. The Tools panel on the right contains a search bar and a list of tool categories. At the bottom, there are buttons for "Help" and "Run...", and a status bar showing coordinates and the current layer name "d.rast map=accumulation@PERMANENT".



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QGIS – 3D View & threejs (LivingWales – Data Cube)

QGIS – 3D View & threejs – Improvements in QGIS 3.22 (and higher) allow faster rendering of 3D tiles of on a height basemap such as our new 1m DTM and DSM of the entire park. We can ‘drape’ flat maps over a 3D surface such as ‘LivingWales’ web services. <https://shapley.github.io/FfaldUchaf>



The Search for a 'Mobile' Tool

The 'Problem'

Most areas away from main roads have little or no network connectivity, there were concerns about 'Warden' safety. They needed to see boundaries, and update 'conditions' in the field.

The solution was 'QField' and in particular the 'GeoPackage' we could pre-pack O'S maps on the device of choice together with a QGIS Project in the ONE package then 'sync' edits with the master QGIS Project back at the office. 'QfieldCloud' is the future option we prefer which will be locally held.



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Craig y nos - Grounds Management Tool

A simple concept, Break the park grounds up into 5m 'hexagonal' parcels (not shown here) with a 5m path network and manage the day to day actions that have been applied to each section where work has been done. This means that daily tasks can be allocated and tracked until complete. This utilises some 'WFS-T' features and operates in a network.



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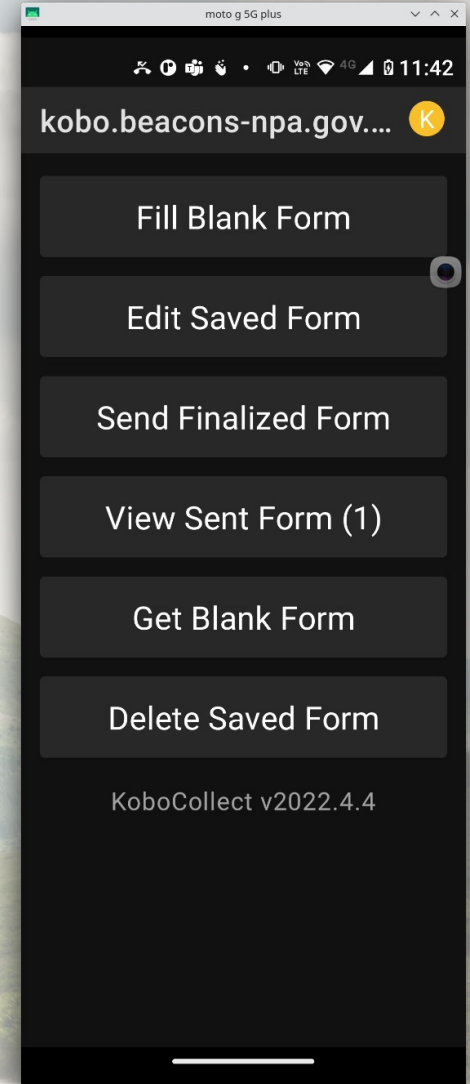
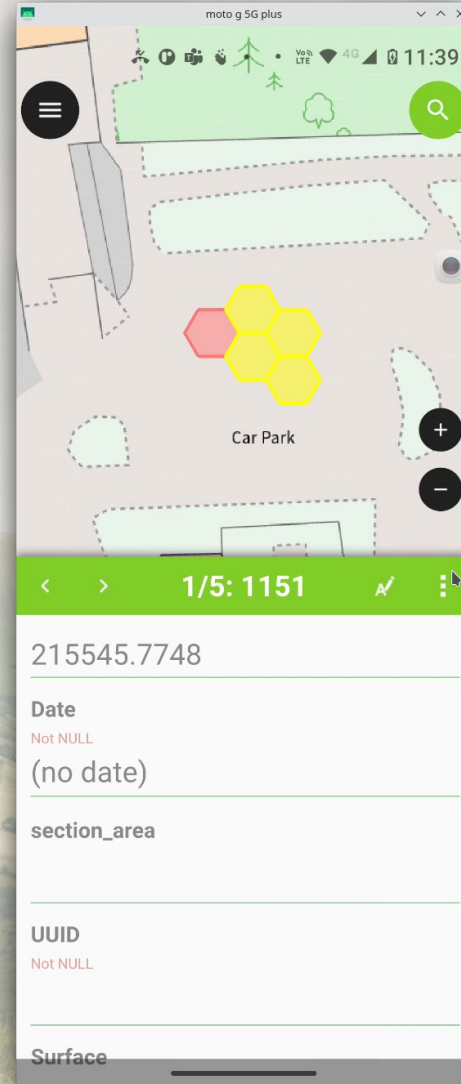
Qfield & Kobotoolbox

QField & Kobotoolbox (local install) – Our new surveying tools, ‘**Kobotoolbox**’ is primarily for ‘non-gis’ users and volunteers and ‘**QField**’ for when you need to take a QGIS projects complete with layers, filters and symbology ‘packed’ onto your mobile phone out into the field to capture more data.

You can ‘sync’ changes when you return to the office.



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10:51 100%

Peatland Su... + [save] [share] [menu]

Survey: > 1

*** What is the percentage cover for heather?**
You selected 'heather' in a previous question

- 1-5%
- 6-10%
- 11-20%
- 21-50%
- 51-75%
- 76-100%

< BACK NEXT >

10:52 100%

Peatland Su... + [save] [share] [menu]

Survey: > 1

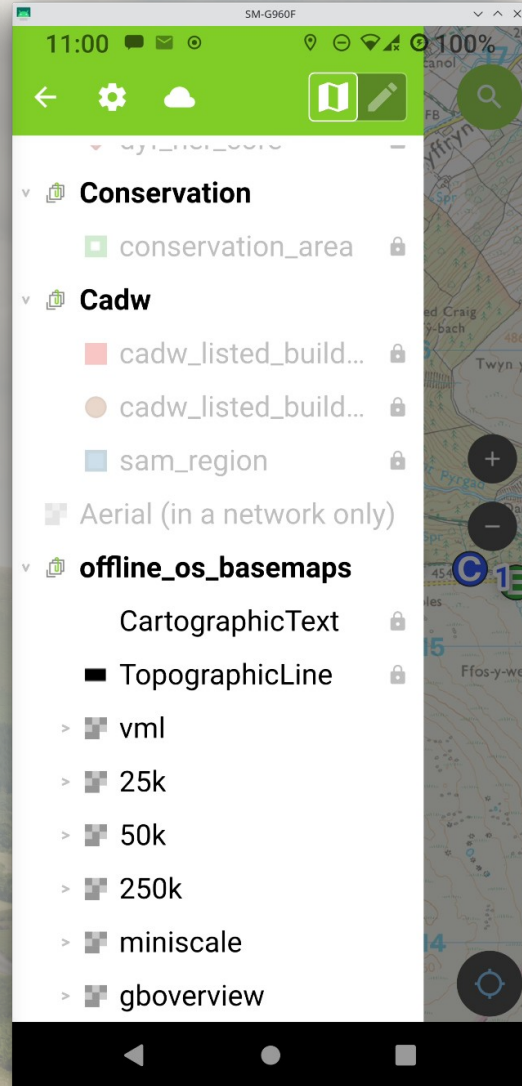
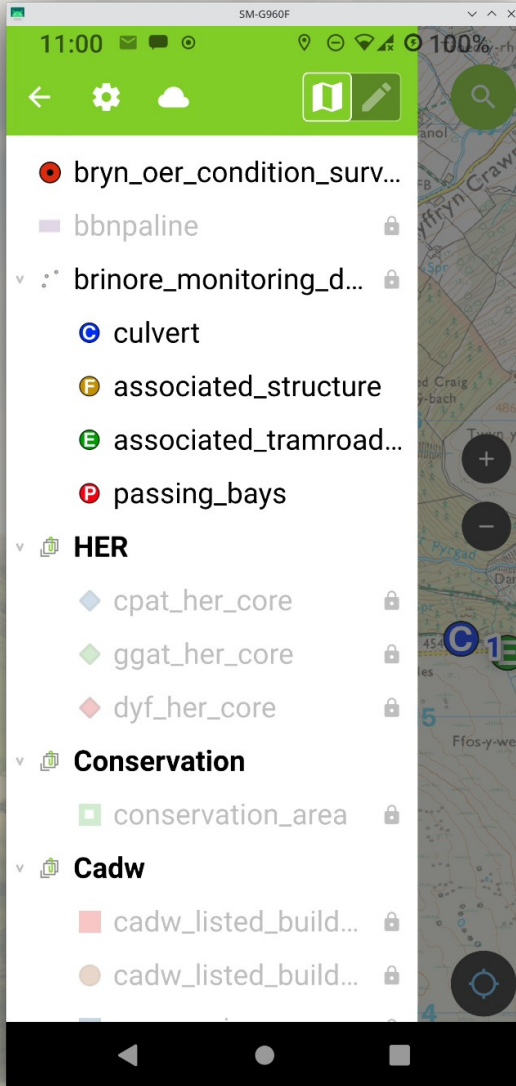
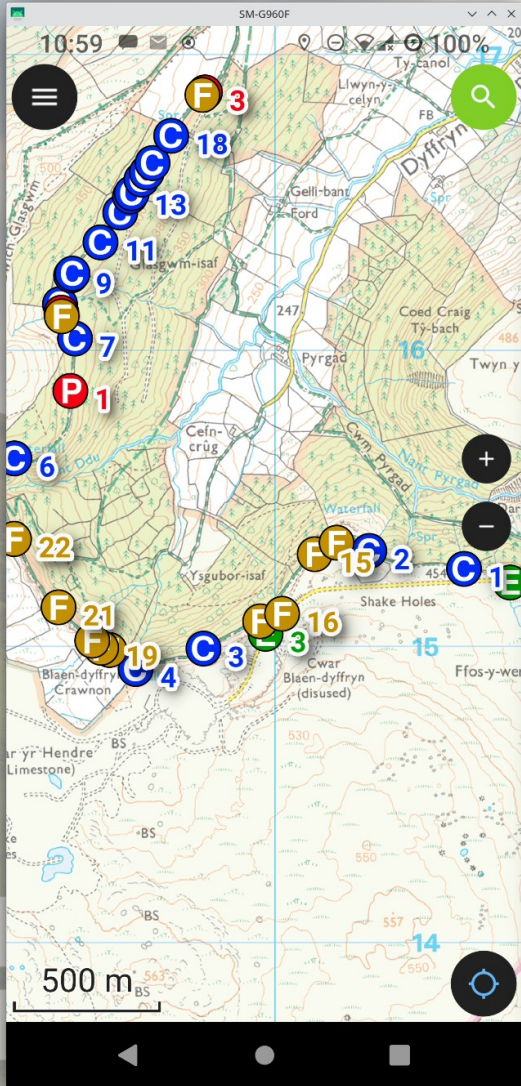
*** Condition Assessment Rating:**
4 = Excellent, 3 = Good, 2 = Moderate, 1 = Poor

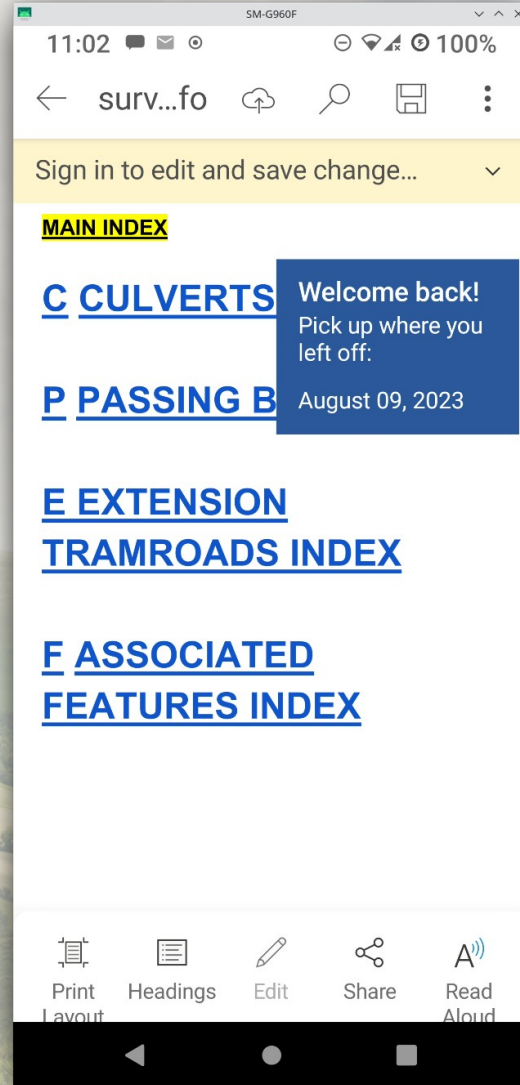
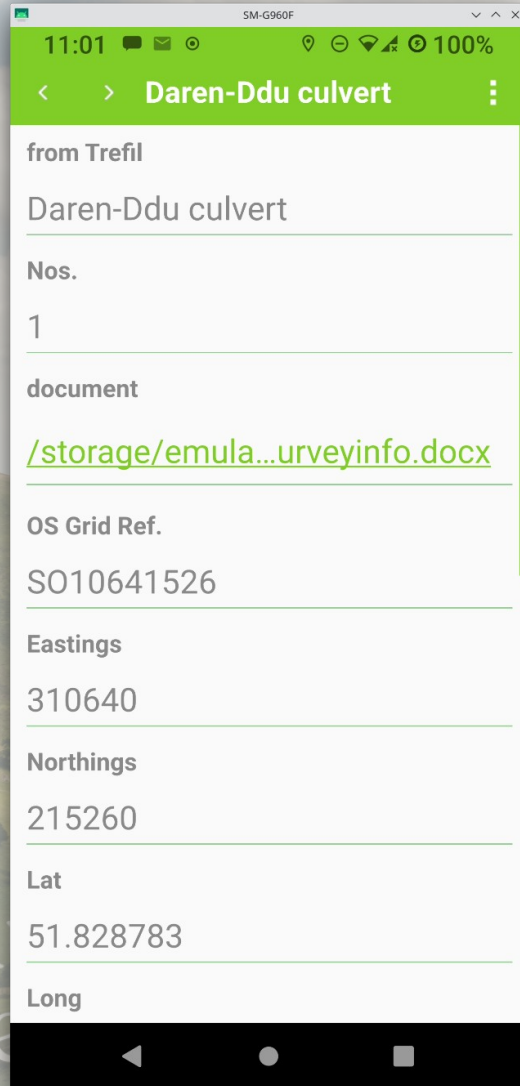
- 4 = Excellent
- 3 = Good
- 2 = Moderate
- 1 = Poor

< BACK NEXT >



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Some drawbacks?

There are some 'workflow' issues we've yet to sort out:-

- Workflow Integration
- Automated Workflows (FME Form/Flow)
 - Modeling the Park 'Eco-System'
- Metadata and Data on DataMapWales



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Some of the future 'Disrupters'

- ChatGPT
- OpenAI
- Google/Cesium3D
- AR/VR Advances
- Drones & Robotics

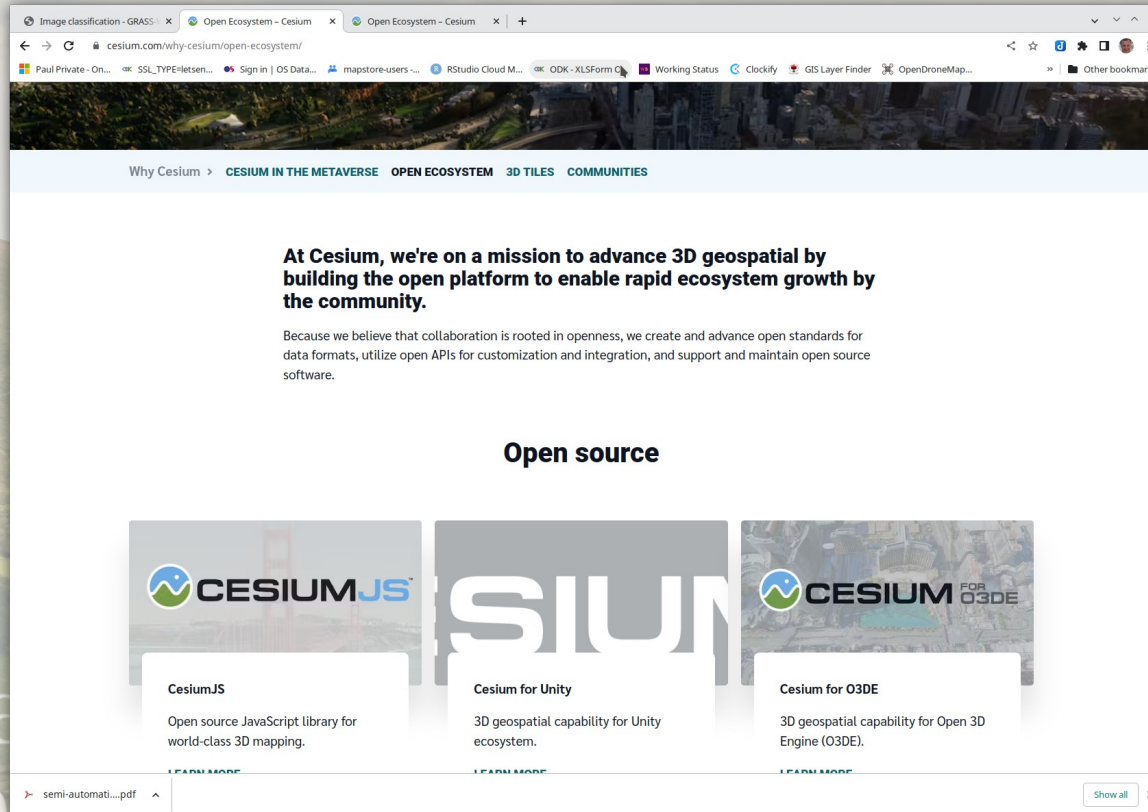
And many more advances...



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I'm looking currently looking at ...

Cesium, Jupyter Notebooks and 'R'



The screenshot shows a web browser window displaying the Cesium website. The browser's address bar shows the URL `cesium.com/why-cesium/open-ecosystem/`. The page features a navigation menu with links for 'Why Cesium', 'CESIUM IN THE METAVERSE', 'OPEN ECOSYSTEM', '3D TILES', and 'COMMUNITIES'. The main content area has a heading 'At Cesium, we're on a mission to advance 3D geospatial by building the open platform to enable rapid ecosystem growth by the community.' followed by a paragraph explaining their commitment to open standards and collaboration. Below this is a section titled 'Open source' which lists three products: CesiumJS, Cesium for Unity, and Cesium for O3DE. Each product has a brief description and a 'LEARN MORE' link. A 'Show all' button is located at the bottom right of the list.

Image classification - GRASS x Open Ecosystem - Cesium x Open Ecosystem - Cesium x +

cesium.com/why-cesium/open-ecosystem/

Paul Private - On... SSL_TYPE=letsen... Sign in | OS Data... mapstore-users... RStudio Cloud M... ODK-XLSForm C... Working Status Clockify GIS Layer Finder OpenDroneMap... Other bookmarks

Why Cesium > CESIUM IN THE METAVERSE OPEN ECOSYSTEM 3D TILES COMMUNITIES

At Cesium, we're on a mission to advance 3D geospatial by building the open platform to enable rapid ecosystem growth by the community.

Because we believe that collaboration is rooted in openness, we create and advance open standards for data formats, utilize open APIs for customization and integration, and support and maintain open source software.

Open source

- CesiumJS**
Open source JavaScript library for world-class 3D mapping.
[LEARN MORE](#)
- Cesium for Unity**
3D geospatial capability for Unity ecosystem.
[LEARN MORE](#)
- Cesium for O3DE**
3D geospatial capability for Open 3D Engine (O3DE).
[LEARN MORE](#)

[Show all](#)



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In Summary...

I'm still learning after 30 years.

There isn't a perfect solution for everything we do.

Not everyone shares my enthusiasm (for spatial).

The skill sets for geospatial are dwindling (everyone wants the 'one button' solution on a iphone)



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Finally... Just to remind me why I carry on.

**I Like 'Failure', 'Success',
'Community',
'Experimentation', 'Problem
Solving and above all...**

'CHOICE'



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