ECOMAPS approach to scalable natural capital mapping

John Watkins Centre for Ecology and Hydrology

Centre for Ecology & Hydrology
NATURAL ENVIRONMENT RESEARCH COUNCIL

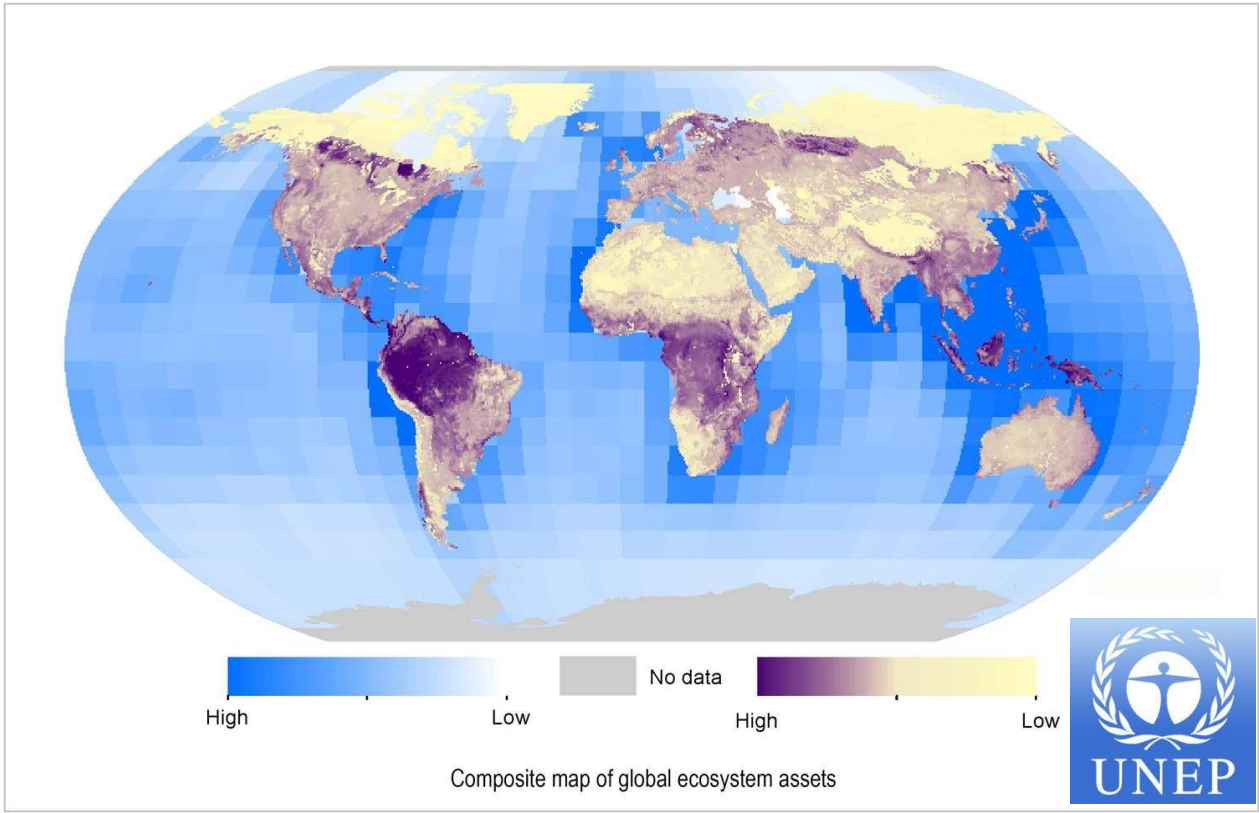
NERC SCIENCE OF THE ENVIRONMENT

Introduction

- The development of natural capital and environmental economics concepts is leading to a demand for new information products for natural capital and ecosystem service delivery
- These products need to work across scales using site-based, earth observation and modelled data

UNEP Report Aug 2014

Towards a global map of natural capital



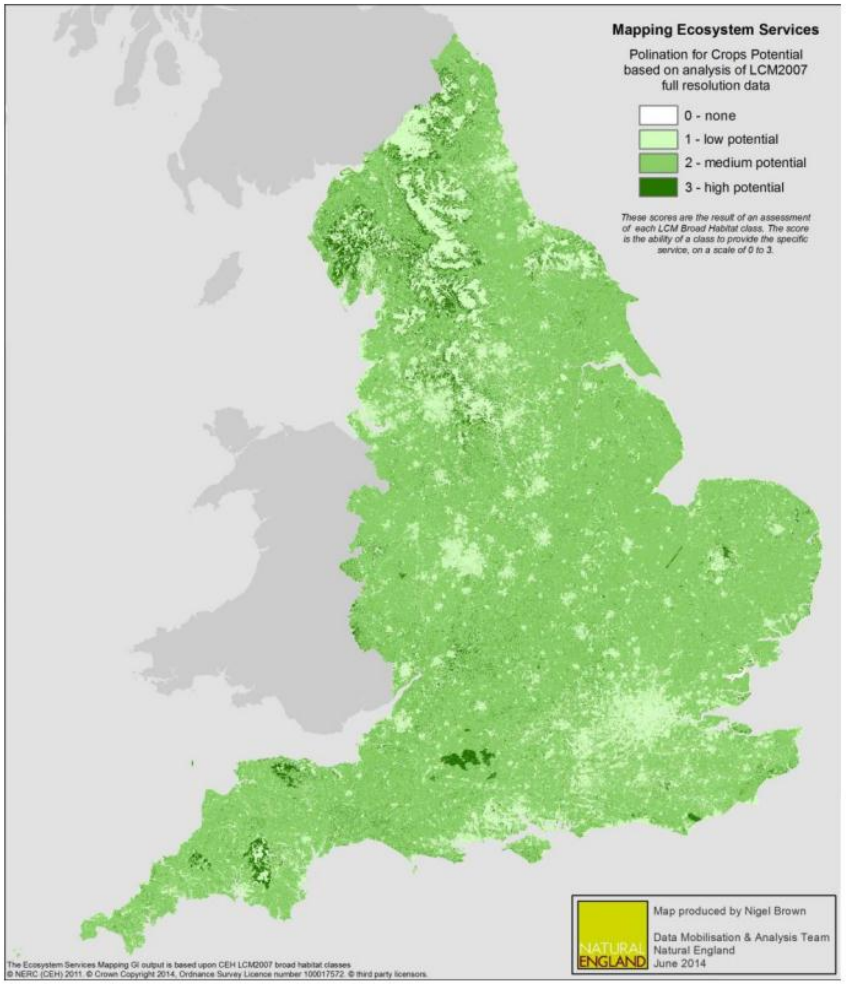
Centre for Ecology & Hydrology
NATURAL ENVIRONMENT RESEARCH COUNCIL

UNEP

Introduction

- Maps can show metrics for state and trend in ecosystem services
- These must be derived from a range of in situ measures, regional-scale data and statistical projections
- Measures for variance and model confidence needs to be provided to assess performance

Pollination (for crops)

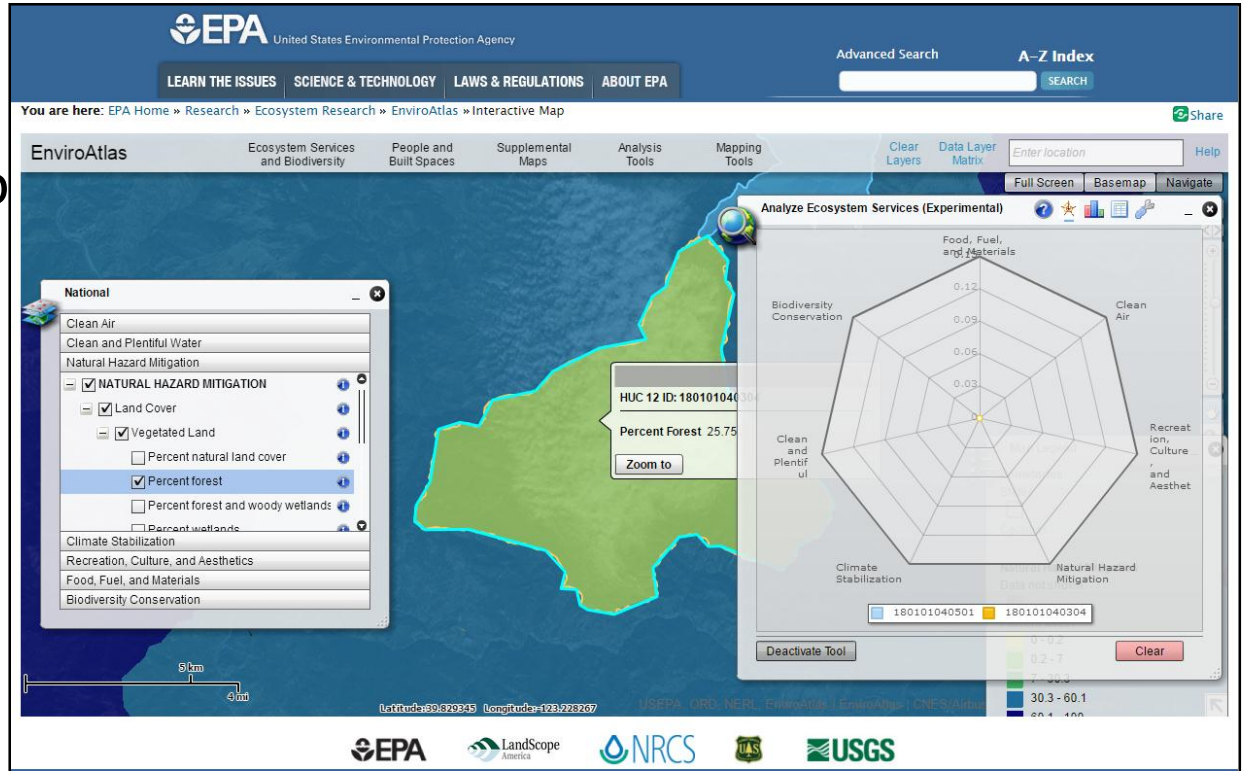


Centre for Ecology & Hydrology
NATURAL ENVIRONMENT RESEARCH COUNCIL

Introduction

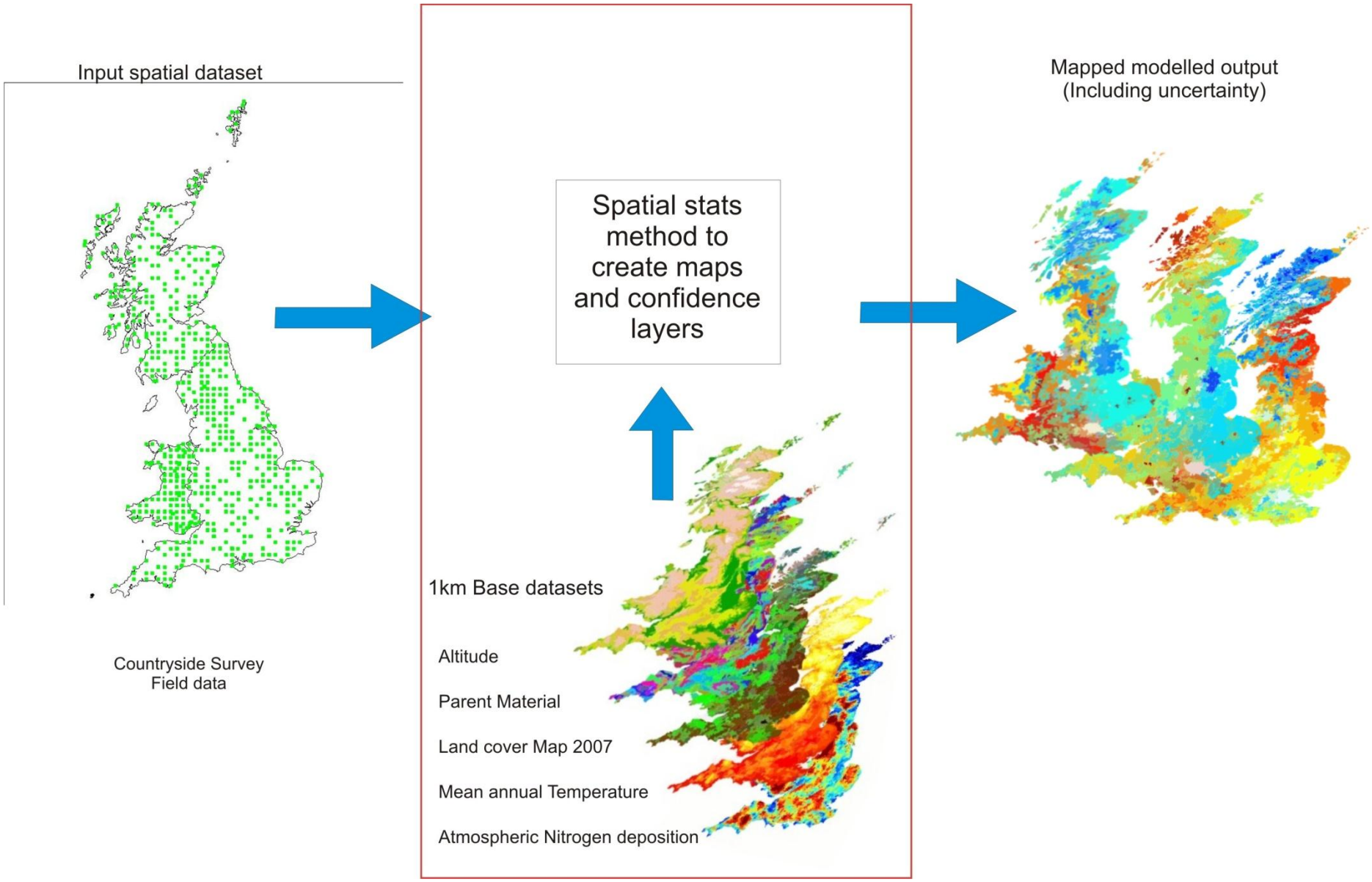
- Tools are needed to interrogate the outputs at a range of scales, to understand their composition and meaning
- This includes the underlying data and how it relates to delivery of ecosystem services

EPA EnviroAtlas:
A range of tools and resources allows users to explore the many benefits people receive from nature

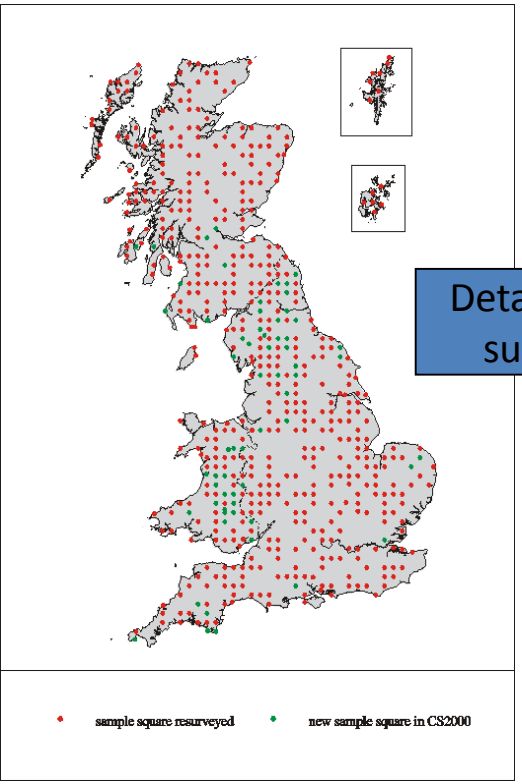


Centre for Ecology & Hydrology
NATURAL ENVIRONMENT RESEARCH COUNCIL

Concept for saleable mapping method



Countryside Survey field data



Detailed repeat survey data

Land Cover

Landscape Features

1 km

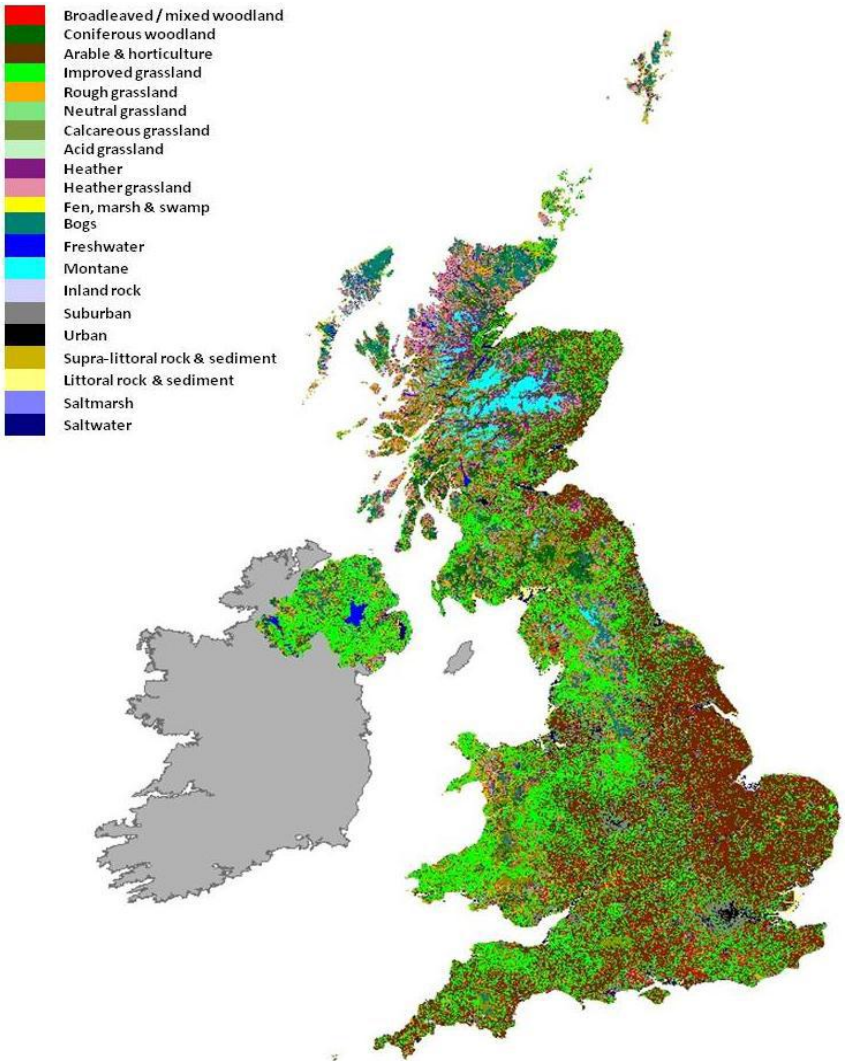
Vegetation quadrats & soils samples

Freshwater & RHS surveys

Centre for Ecology & Hydrology
NATURAL ENVIRONMENT RESEARCH COUNCIL

NERC SCIENCE OF THE ENVIRONMENT

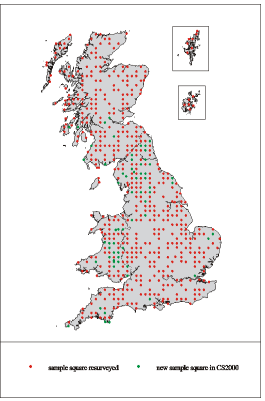
National-scale data sources



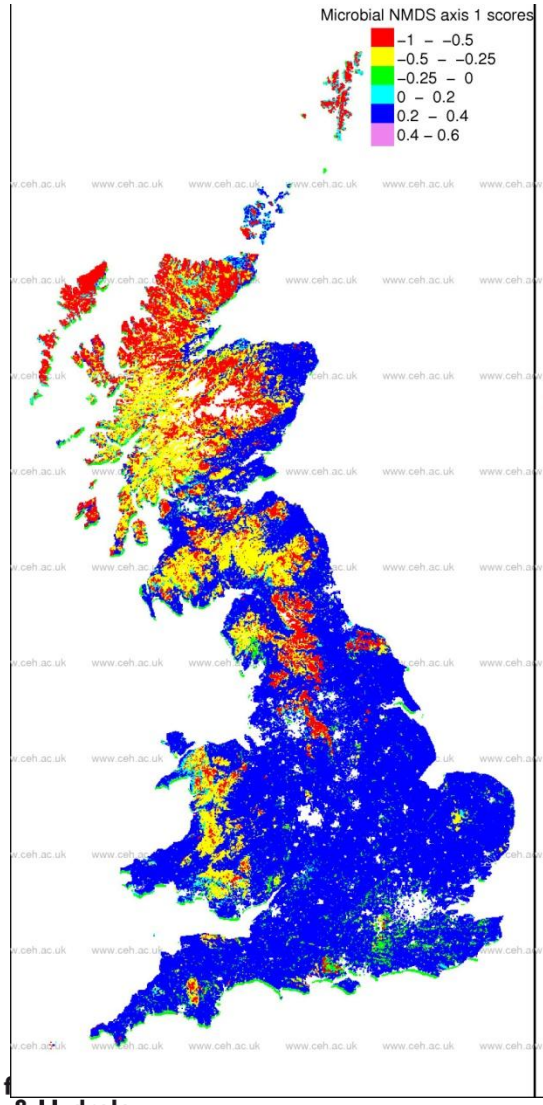
Centre for Ecology & Hydrology
NATURAL ENVIRONMENT RESEARCH COUNCIL

NERC SCIENCE OF THE ENVIRONMENT

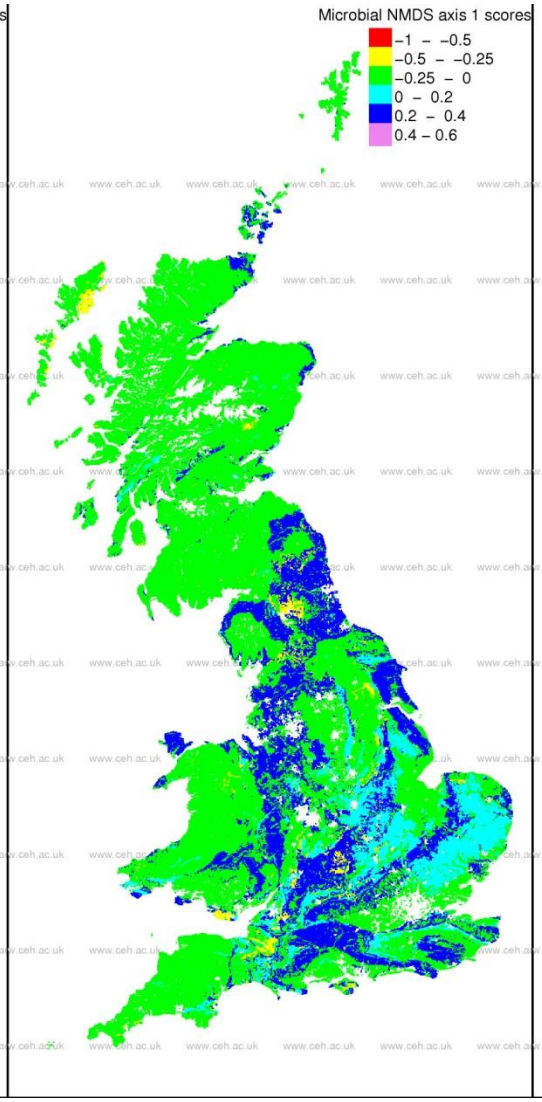
EcoMaps application development



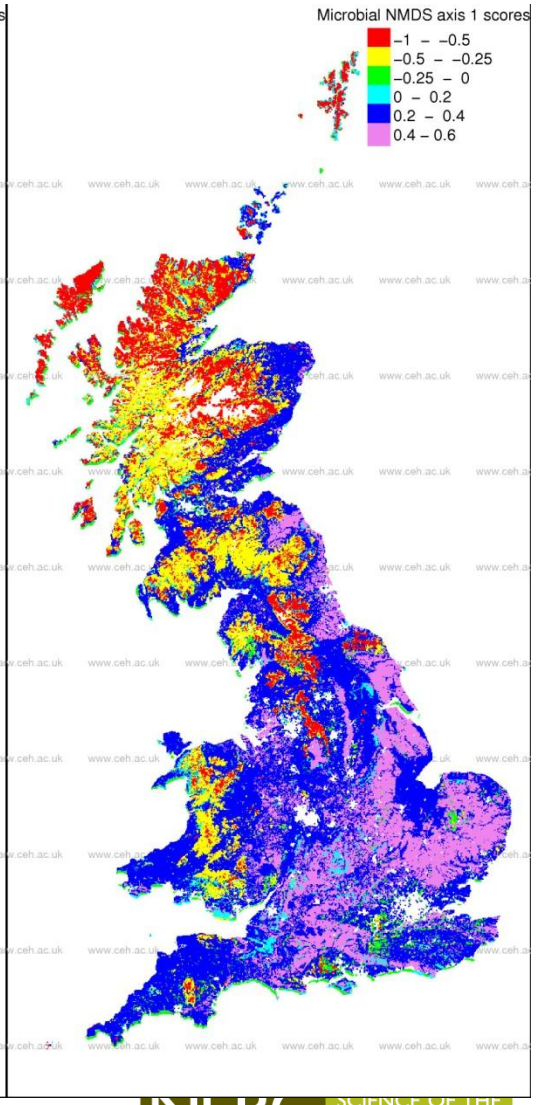
CEH LCM 2007



BGS PMM



Combined Map



Centre for Ecology & Hydrology
NATURAL ENVIRONMENT RESEARCH COUNCIL

NERC SCIENCE OF THE ENVIRONMENT

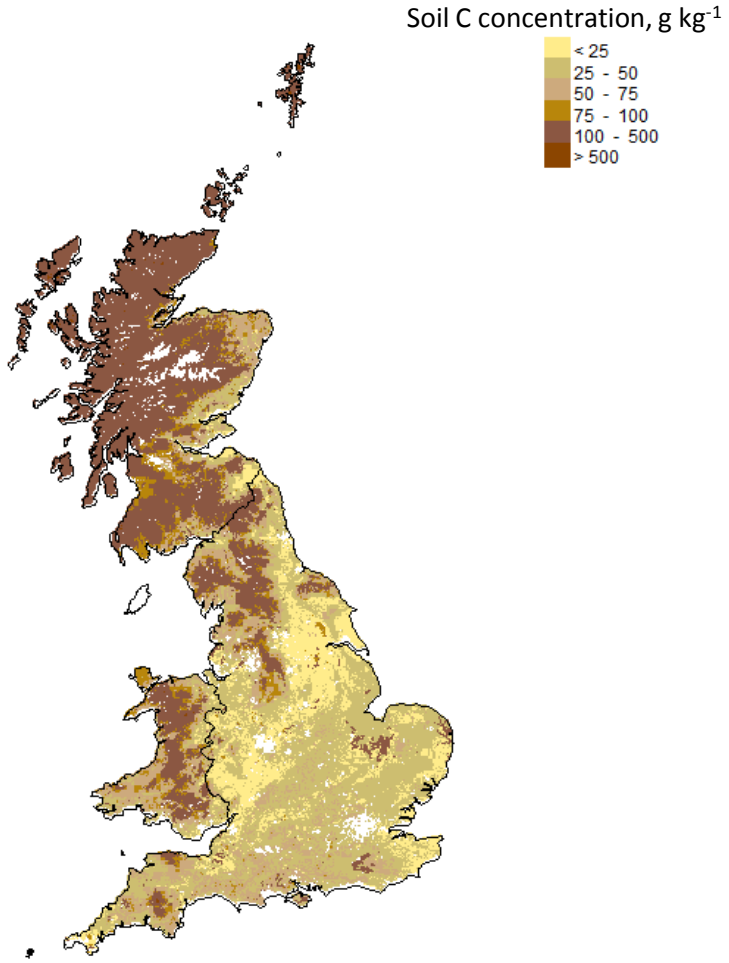
Estimating confidence

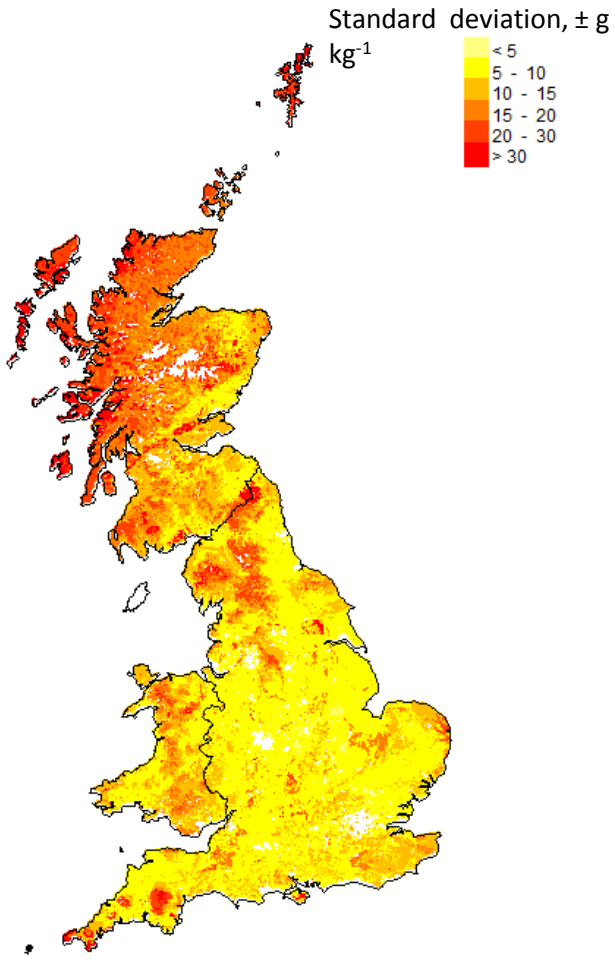
CEH LCM 2007 **BGS PMM** **Combined Map**

Development of specific spatial models

Soil Characteristics predicted using:

- Land cover, Climate, deposition, geology

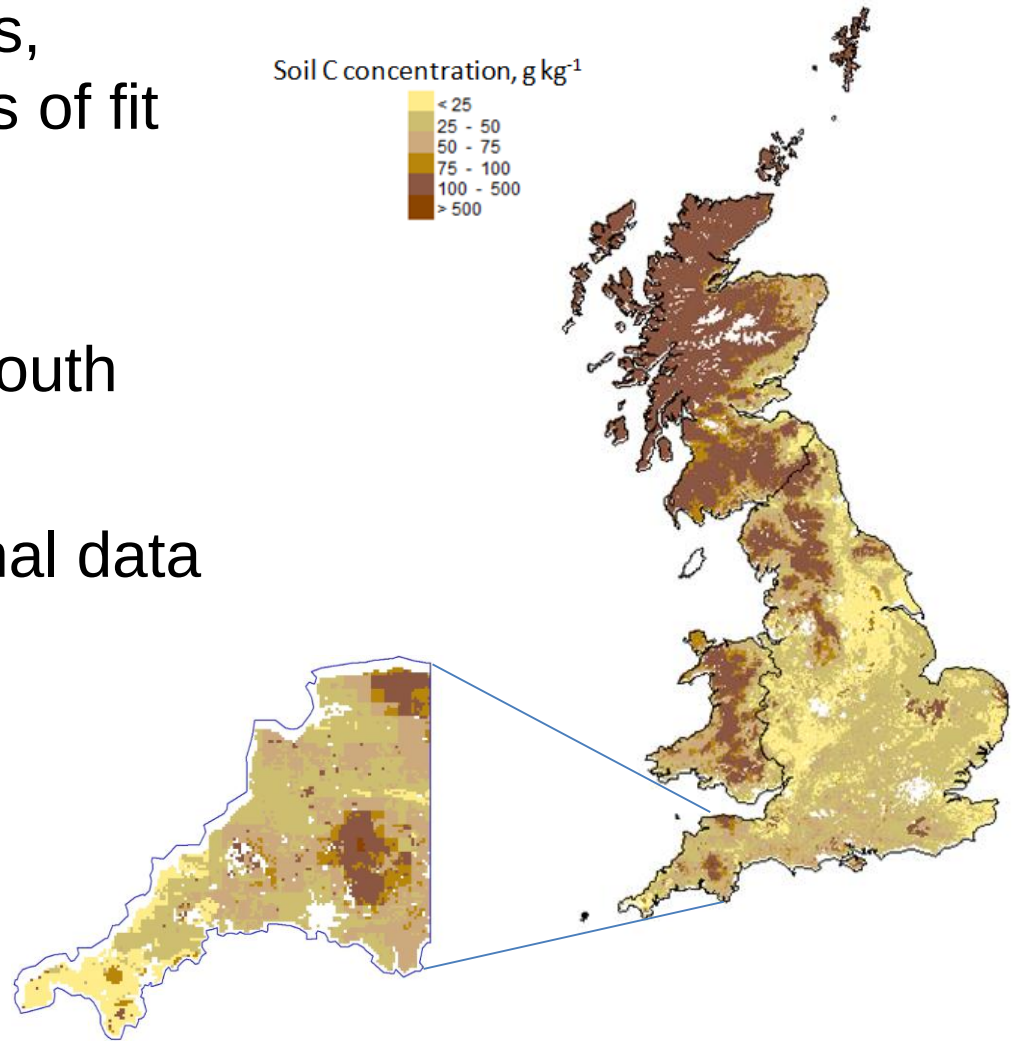




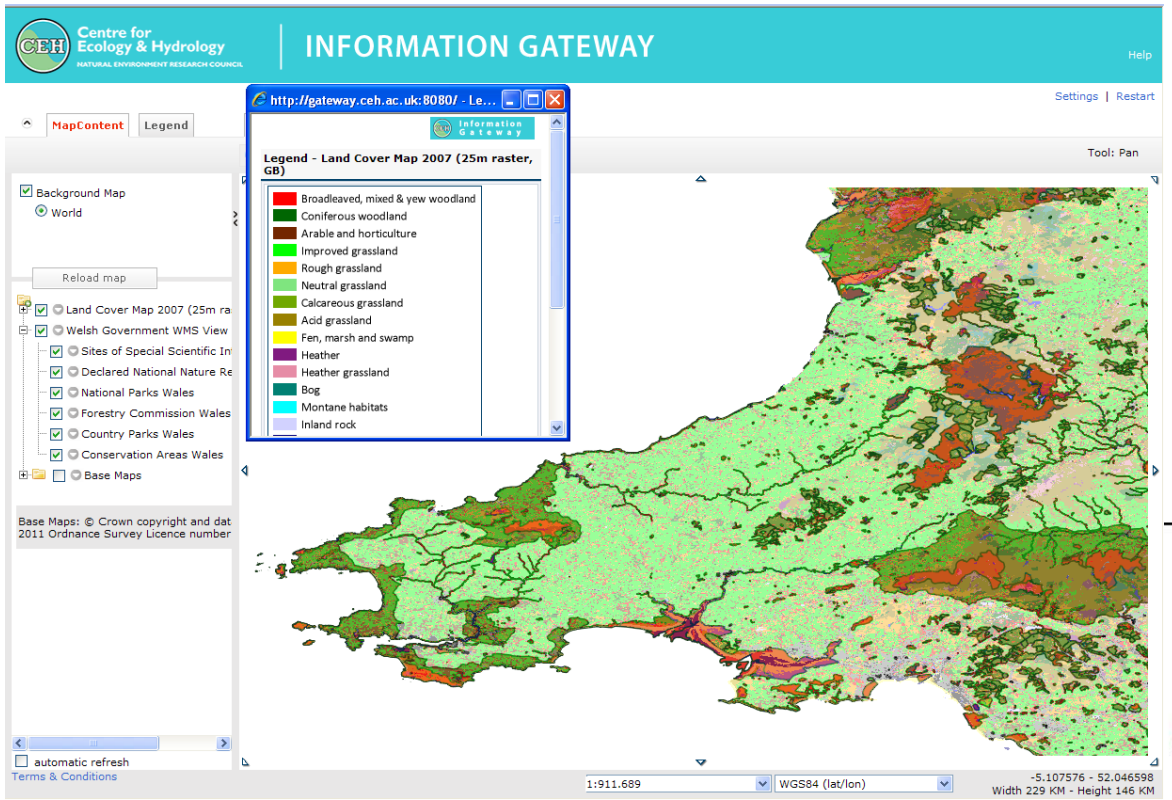
Centre for Ecology & Hydrology
NATURAL ENVIRONMENT RESEARCH COU

Concentration of Soil Carbon results

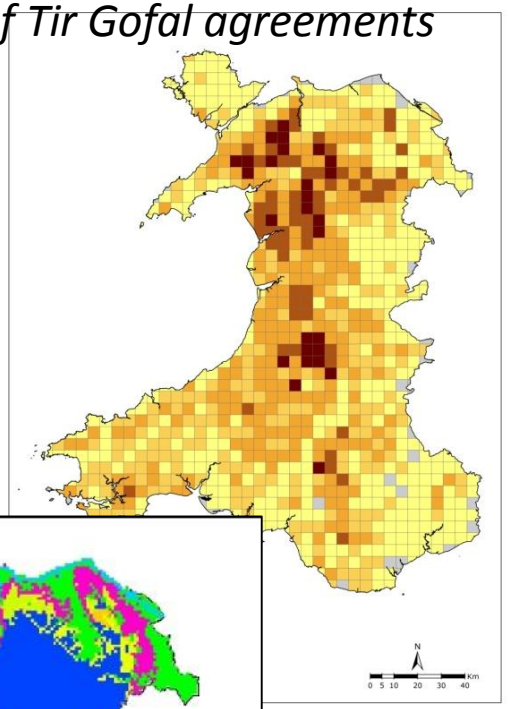
- Model produces means, variance and goodness of fit measures
- This can be applied at different scale – e.g. South West
- However, use of national data produces best models

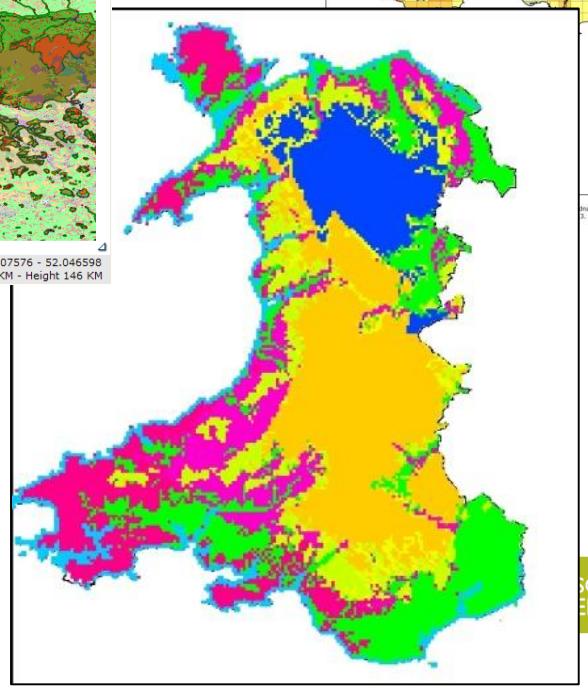


Regional Mapping for Welsh Glastir



Density of Tir Gofal agreements

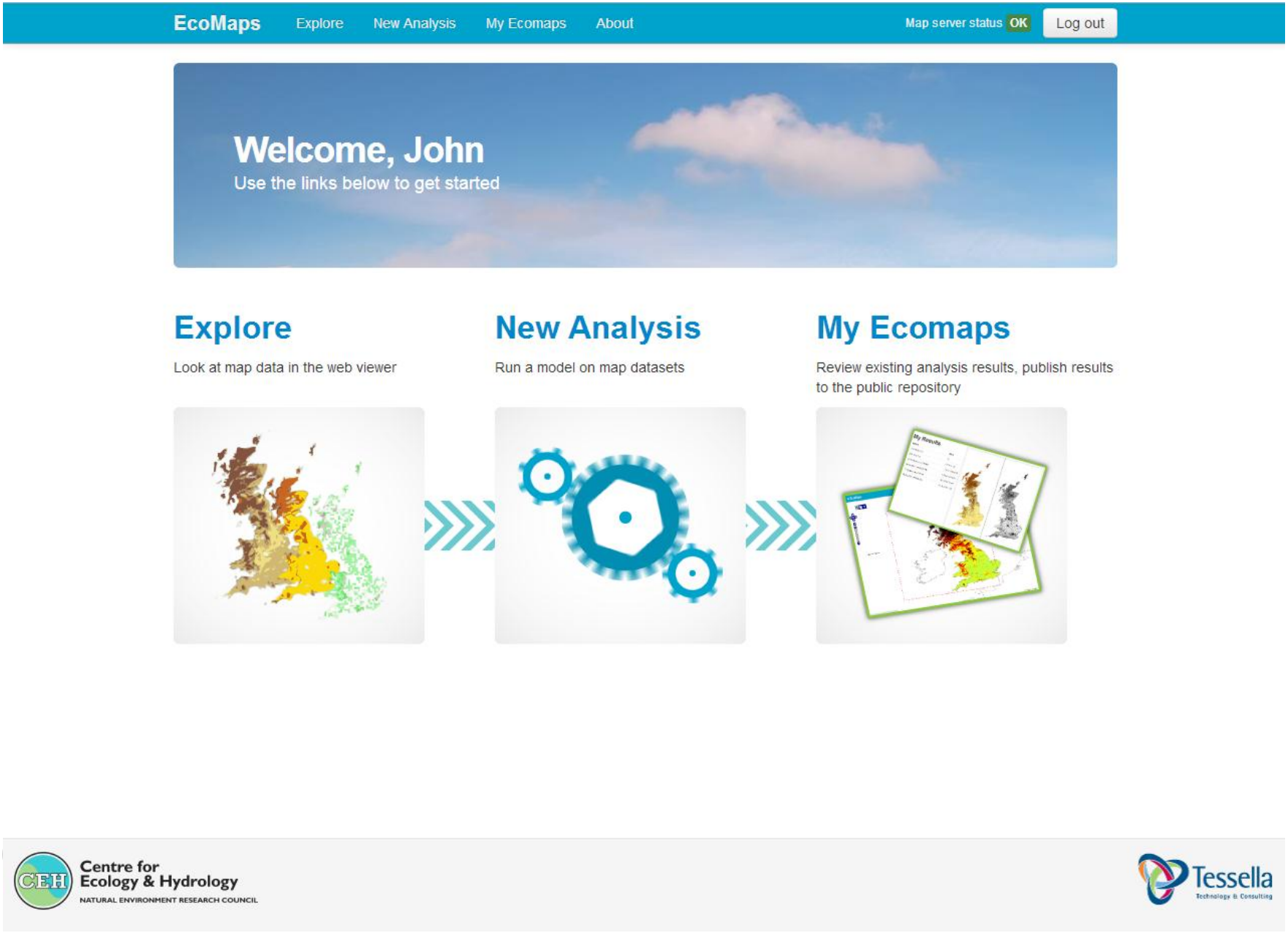


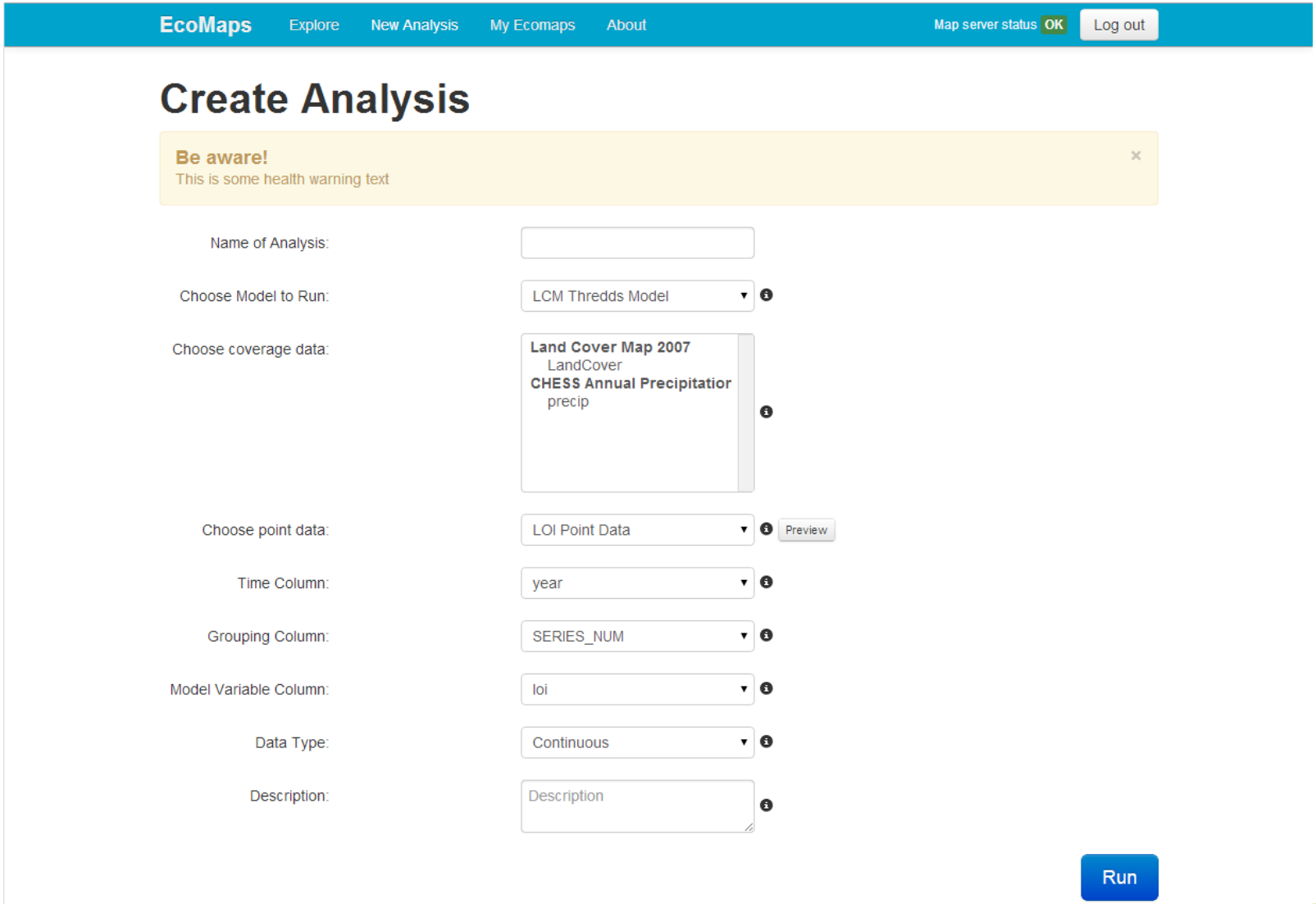


Centre for Ecology & Hydrology
NATURAL ENVIRONMENT RESEARCH COUNCIL

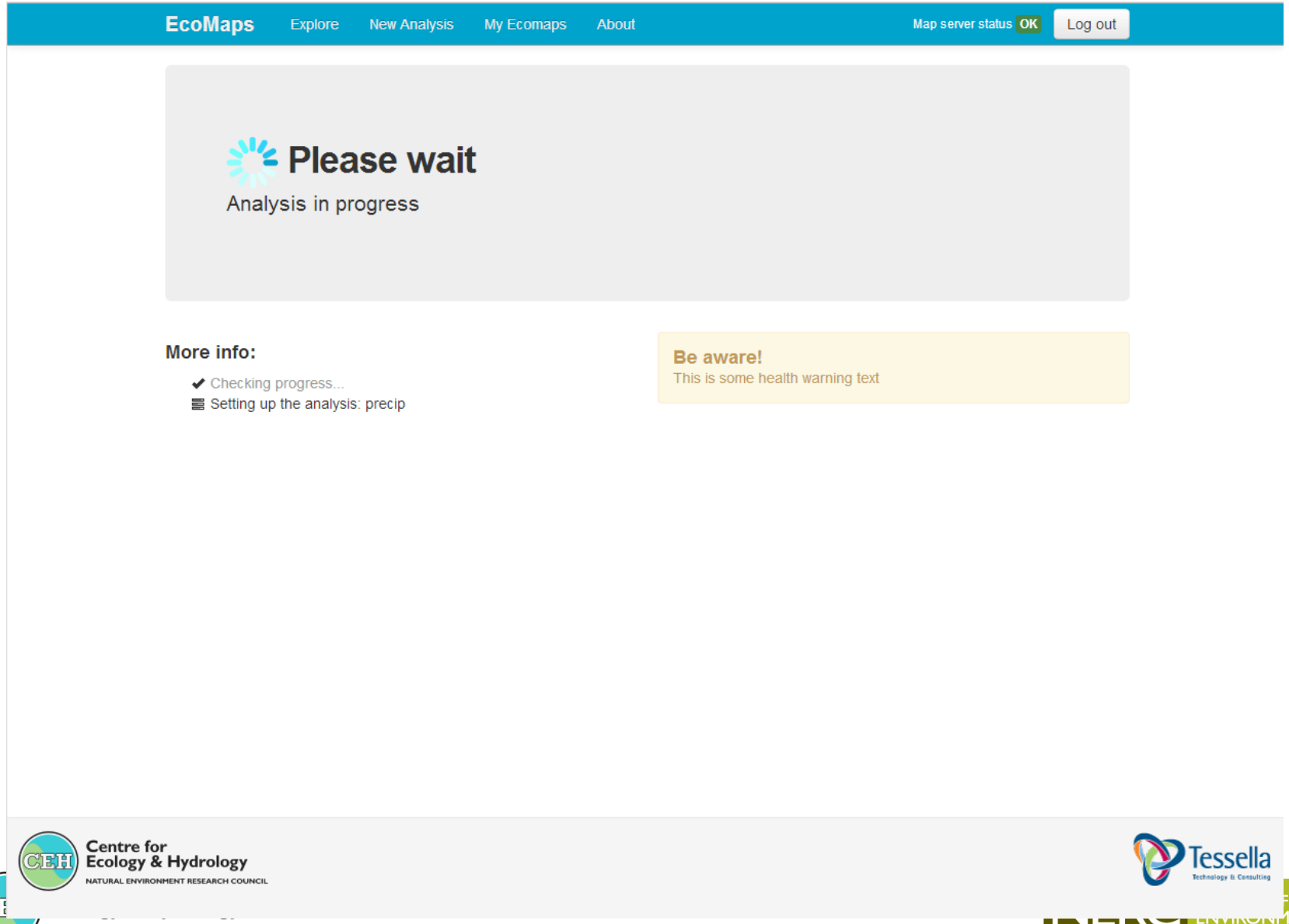
SCIENCE OF THE ENVIRONMENT

EcoMaps application development





NATURAL ENVIRONMENT RESEARCH COUNCIL


EcoMaps
Explore
New Analysis
My Ecomaps
About
Map server status OK
Log out
Please wait
Analysis in progress
More info:
Checking progress...
Setting up the analysis: precip
Be aware!
This is some health warning text
Centre for Ecology & Hydrology
NATURAL ENVIRONMENT RESEARCH COUNCIL
Tessella
Technology & Consulting
NATURAL ENVIRONMENT RESEARCH COUNCIL

EcoMaps Explore New Analysis My Ecomaps About Map server status OK Log out

John_test1

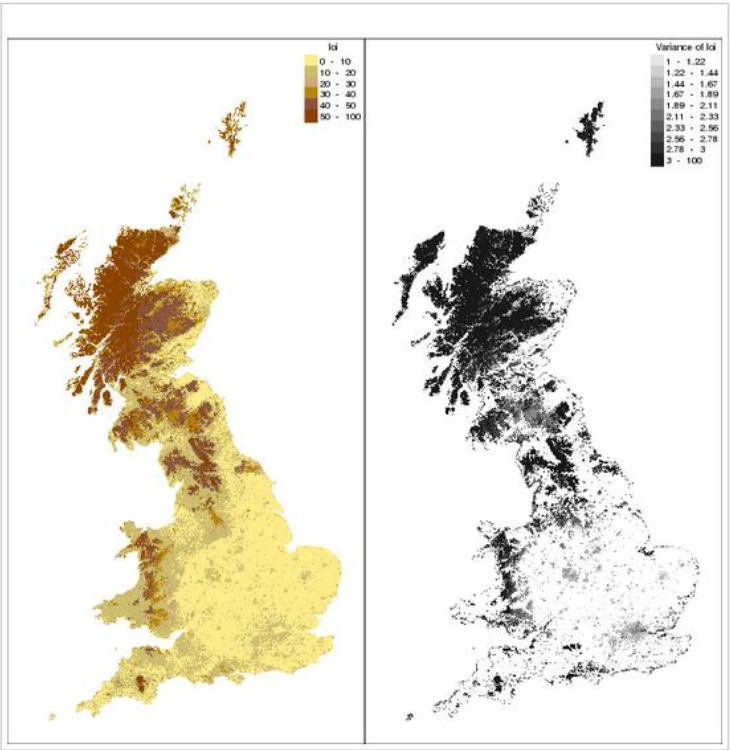
Run by Watkins, John W. on 31-Mar-2014 12:34

Actions

- Publish
- Re-run Analysis
- Download
- Delete

Map Results | Fitting Results | All results

Result	Value
Geospatial Longitude Min	-7.55715984208
Geospatial Longitude Max	3.63202051545
Geospatial Latitude Min	49.7668072319
Geospatial Latitude Max	61.4645902326



EcoMaps Explore New Analysis My Ecomaps About Map server status OK Log out

John_test1

Run by Watkins, John W. on 31-Mar-2014 12:34

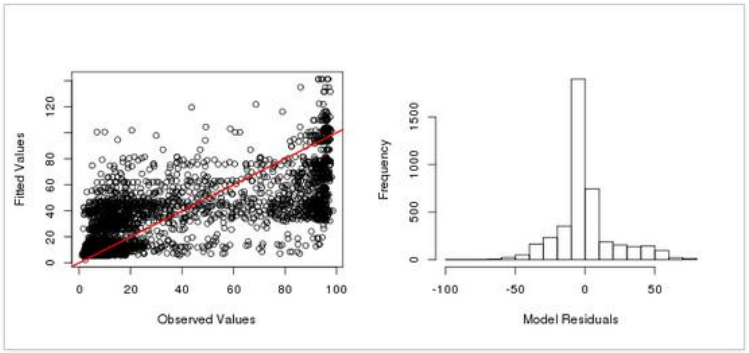
Actions

- Publish
- Re-run Analysis
- Download
- Delete

Map Results | Fitting Results | All results

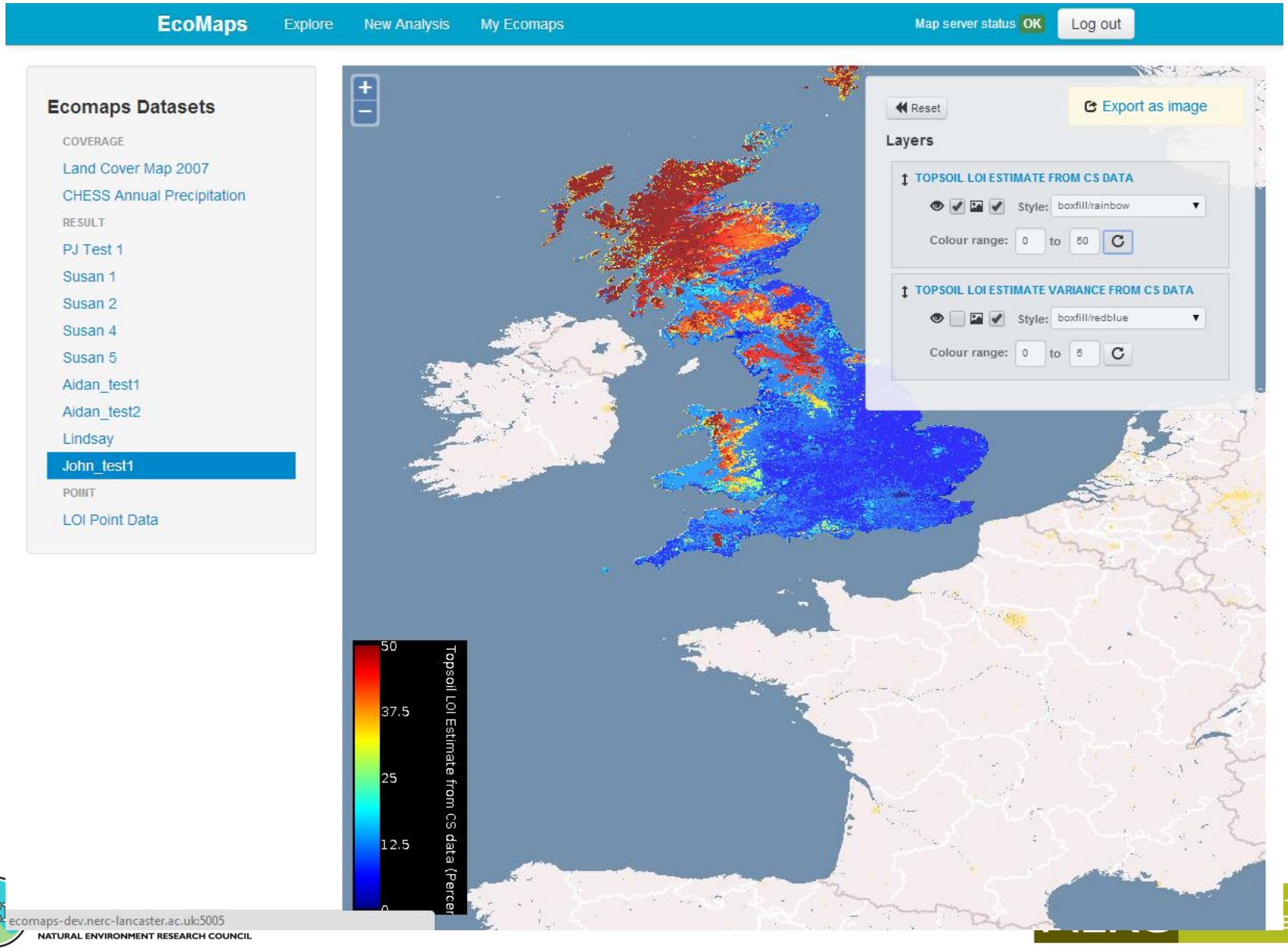
Fit values

AIC	20.4322129219
RMS Error	0.580992597764
R^2	

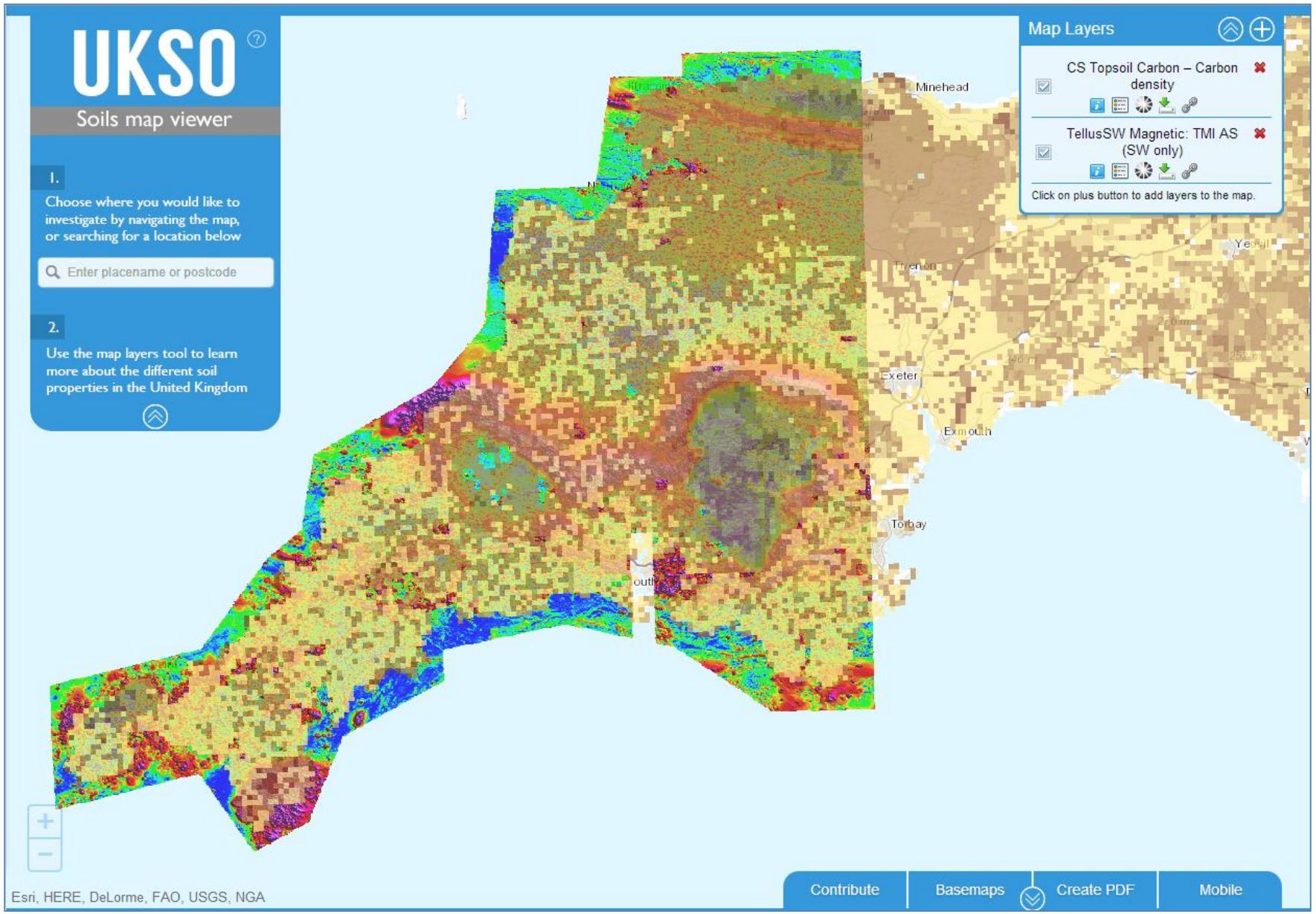


Centre for Ecology & Hydrology
NATURAL ENVIRONMENT RESEARCH COUNCIL

Tessella
Technology & Consulting


EcoMaps
Explore
New Analysis
My Ecomaps
Map server status OK
Log out
Ecomaps Datasets
COVERAGE
Land Cover Map 2007
CHESS Annual Precipitation
RESULT
PJ Test 1
Susan 1
Susan 2
Susan 4
Susan 5
Aidan_test1
Aidan_test2
Lindsay
John_test1
POINT
LOI Point Data
Reset
Export as image
Layers
TOPSOIL LOI ESTIMATE FROM CS DATA
Style: boxfill/rainbow
Colour range: 0 to 50
TOPSOIL LOI ESTIMATE VARIANCE FROM CS DATA
Style: boxfill/redblue
Colour range: 0 to 5
50
37.5
25
12.5
Topsoil LOI Estimate from CS data (Percen
ecomaps-dev.nerc-lancaster.ac.uk:5005
NATURAL ENVIRONMENT RESEARCH COUNCIL

Map Layers in UKSO and other portals



Summary

1. Natural Capital mapping requires access to comprehensive site-level data as well as national coverage data sets

2. Metrics for Natural Capital and extrapolation models have been developed to produce scalable national maps

3. These maps need to be investigated to understand the variability and power of the underlying predictions

4. The ECOMAPS application has been developed to enable researchers to produce and explore models and maps in this way

Thank you and any questions?