

**Report Prepared for the Department for  
Environment, Food and Rural Affairs**

## Report of Activity for LandIS Support



# **Report of Activity for LandIS Support**

## **For the Department for Environment, Food and Rural Affairs**

by  
**Caroline Keay, Timothy Farewell, Andrew Rayner**

Quarterly Progress Report  
1<sup>st</sup> Apr – 30<sup>th</sup> Jun 2009  
DEFRA Contract No. SP0901  
NSRI Contract No. WN32150N

### RESPONSIBILITY FOR THIS DOCUMENT

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### CHANGE HISTORY

<i>Version</i>	<i>Date</i>	<i>Summary of change</i>
1.0	02/07/2009	First Issue

Reviewer: Dr Stephen Hallett

*Reference to this report should be made as follows:*

KEAY, C.A.; FAREWELL, T.S.; RAYNER, A.P.; (2009). Report of Activity for LandIS Support for the Department for Environment, Food and Rural Affairs. Quarterly Progress Report Apr – Jun, 2009, NSRI research report number WN32150N for DEFRA, 15pp.

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# Progress with the LandIS Support Contract

Reporting Period: 1 Apr, 2009 – 30 Jun, 2009

## Database Maintenance

No specific maintenance issues have been experienced this period. The new virtual server is continuing to provide good service. The service team in the Cranfield University IT computing group provides a high standard of maintenance care and support.

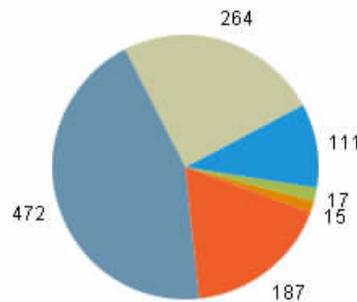
## Soil Site Reports

The Soil Site Reporter (<http://www.landis.org.uk/reports/>) continues to be used extensively. In the current period there have been 37 new companies and 215 new users registered. Importantly, and following our recent promotional campaign, this now includes 22 new Universities who have registered to take advantage of our initiative to provide free soil site reports as a general educational resource to all UK University Undergraduate students.

The following figures illustrate the level of response and use of the reporter to-date (figures 1-2):

Total companies: 257  
 Total users: 1066  
 Company/user Totals

- DEFRA
- Environment Agency
- Cranfield University
- PERSONAL USE
- Universities (excl. Cranfield)
- Other companies (<10 users)



Total universities (excl. Cranfield): 101  
 Total students: 472  
 University/student Totals

- University of Bradford
- University of Reading
- University of Bristol
- Hadlow College
- University of Gloucestershire
- University of Leeds
- University of Brighton
- Harper Adams University College
- University of Plymouth
- Royal Agriculture College
- University of Greenwich
- Myerscough College
- Other universities (<10 students)

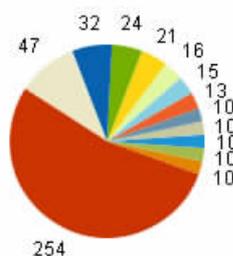


Figure 1 Summary of Soil Site Reporter uptake by user group

## Report purchases by purchase type

Free (£44,192.00)      Full payment (£25,132.99)  
Free voucher (£8,514.00)      Discounted voucher (£15.28)

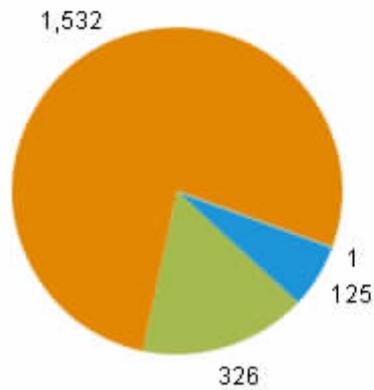


Figure 2 Summary of report types served by Soil Site Reporter

### ***INSPIRE Compliance***

The paper written for last years INSPIRE Conference in Slovenia, entitled "Moving the National Soil Database for England and Wales (LandIS) towards INSPIRE Compliance", has now been published.

Keay, C.A. & Hallett, S.H. & Farewell, T.S. & Rayner, A.P. & Jones, R.J.A. (2009) "Moving the National Soil Database for England and Wales (LandIS) towards INSPIRE Compliance", International Journal Of Spatial Data Infrastructures Research, 134-155.

The paper can be accessed at <http://ijsdir.jrc.ec.europa.eu/>.

## Soils Site Reporter Upgrade

Work is underway for the second version of the popular soils site reporter. Key additions will include clearer mapping as well as user-specified mapping extents. This will be achieved by allowing users to uploading GIS shapefiles, or to draw areas of interest directly on-screen on a map (see figure 3). Both these additions are in response to user requests.

Site reporter version 2.0 is due to be released in January 2010.

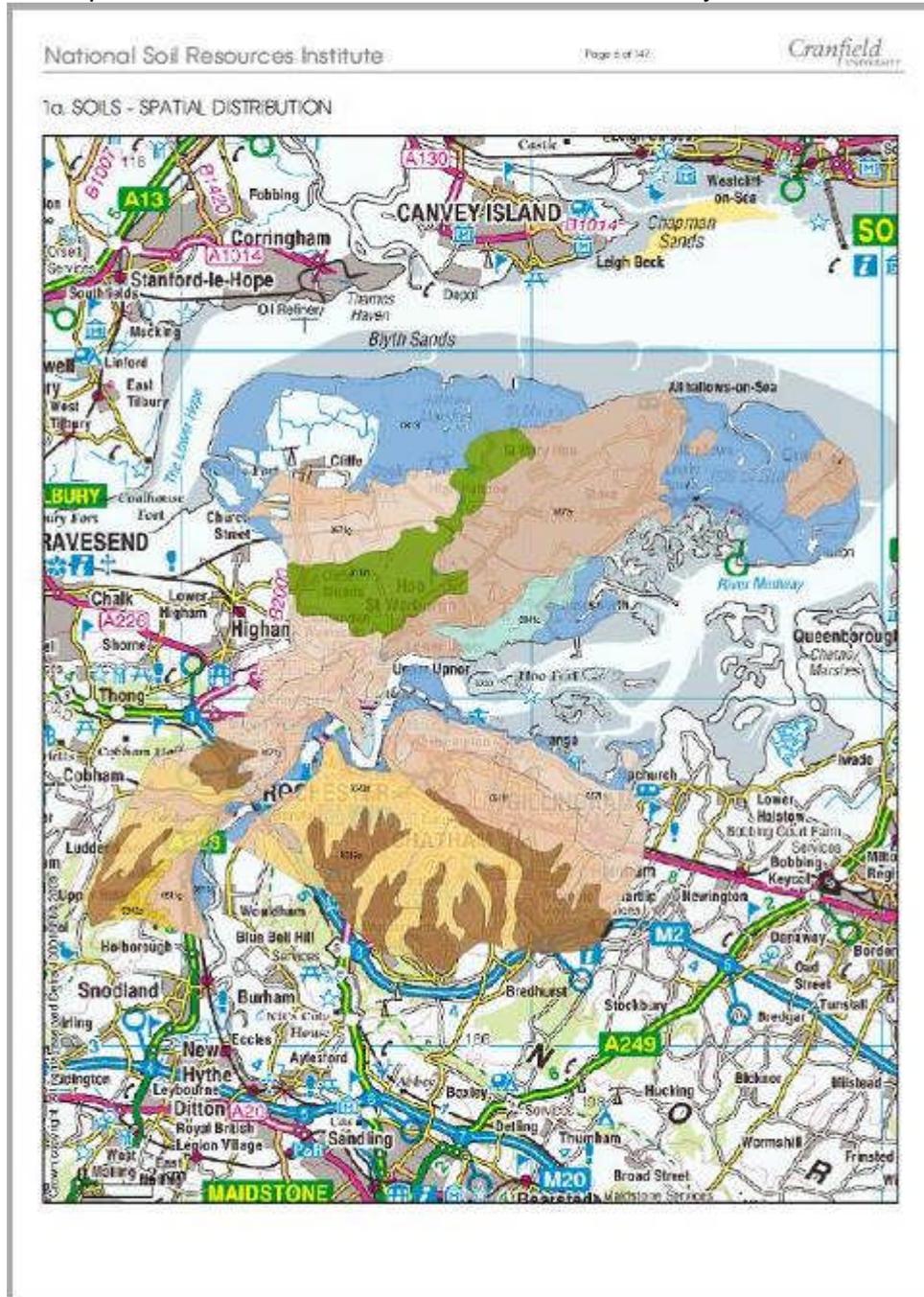


Figure 3 Sample of user-specified mapping extents in the Soil Site Reporter

## New Website

A new look LandIS website has now been launched (<http://www.landis.org.uk>). This now provides a more contemporary, standards-compliant format, improves the experience users will have and hopefully make it easier for our users to learn more about LandIS and its capabilities. Web-statistics will also be captured and reported on with the new site in a way that will assist us to understand how users use the site and so to guide future improvements.

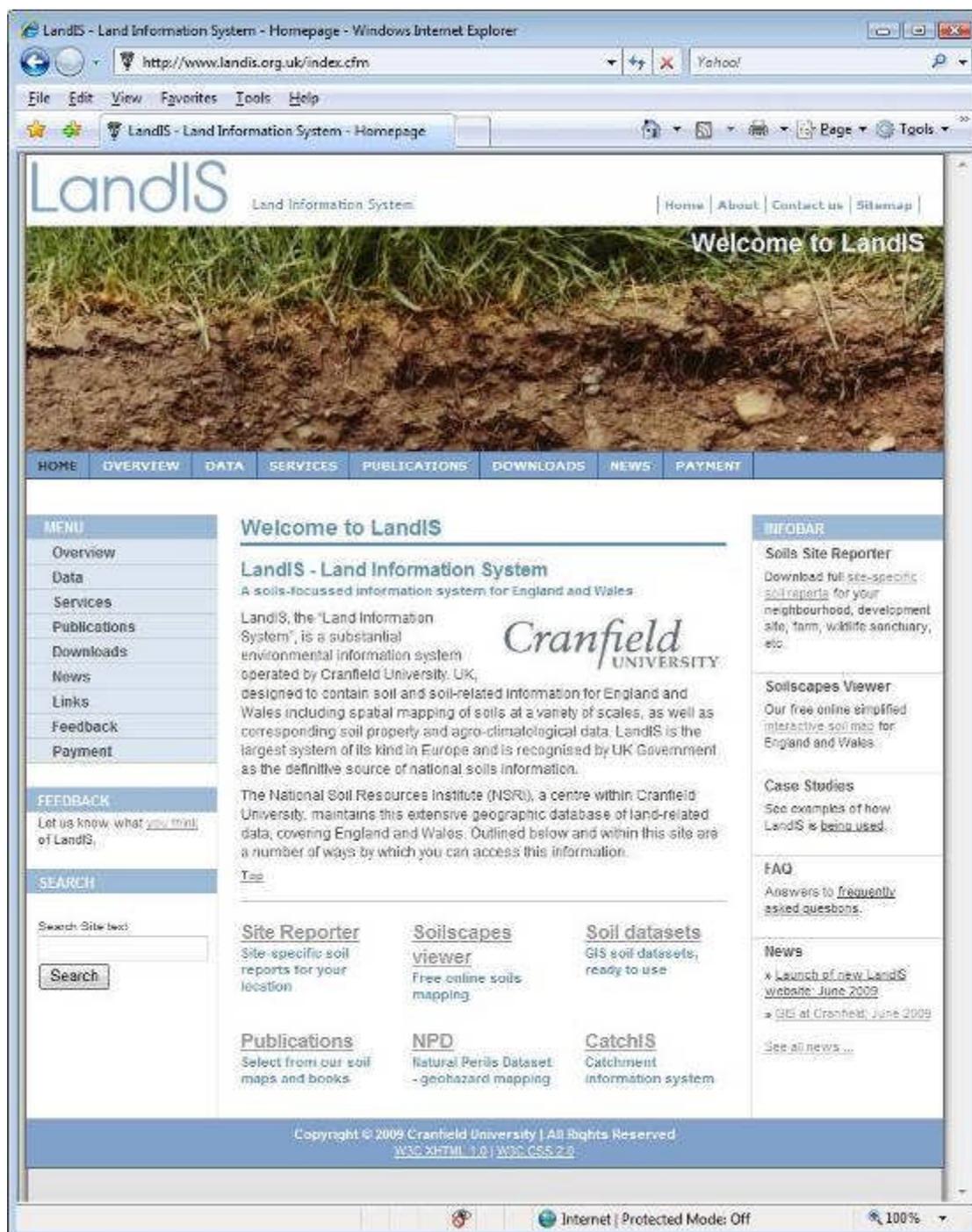


Figure 4 New look LandIS website

## Improved Data Descriptions

A suite of new data descriptions are being created to enable better understanding of the datasets on offer. These will include descriptive text, maps and illustrative photographs. Together these new documents, which will be both downloadable and viewable on the web, will help users more successfully identify the most appropriate datasets for their needs, and recognise the great deal of influence that soil has on a number of environmental factors.

As a proof of concept we will be generating a small subset of these new descriptions for our Soilscales product (including habitats, fertility, simple texture, drainage and landcover) which are planned to be online by January 2010.

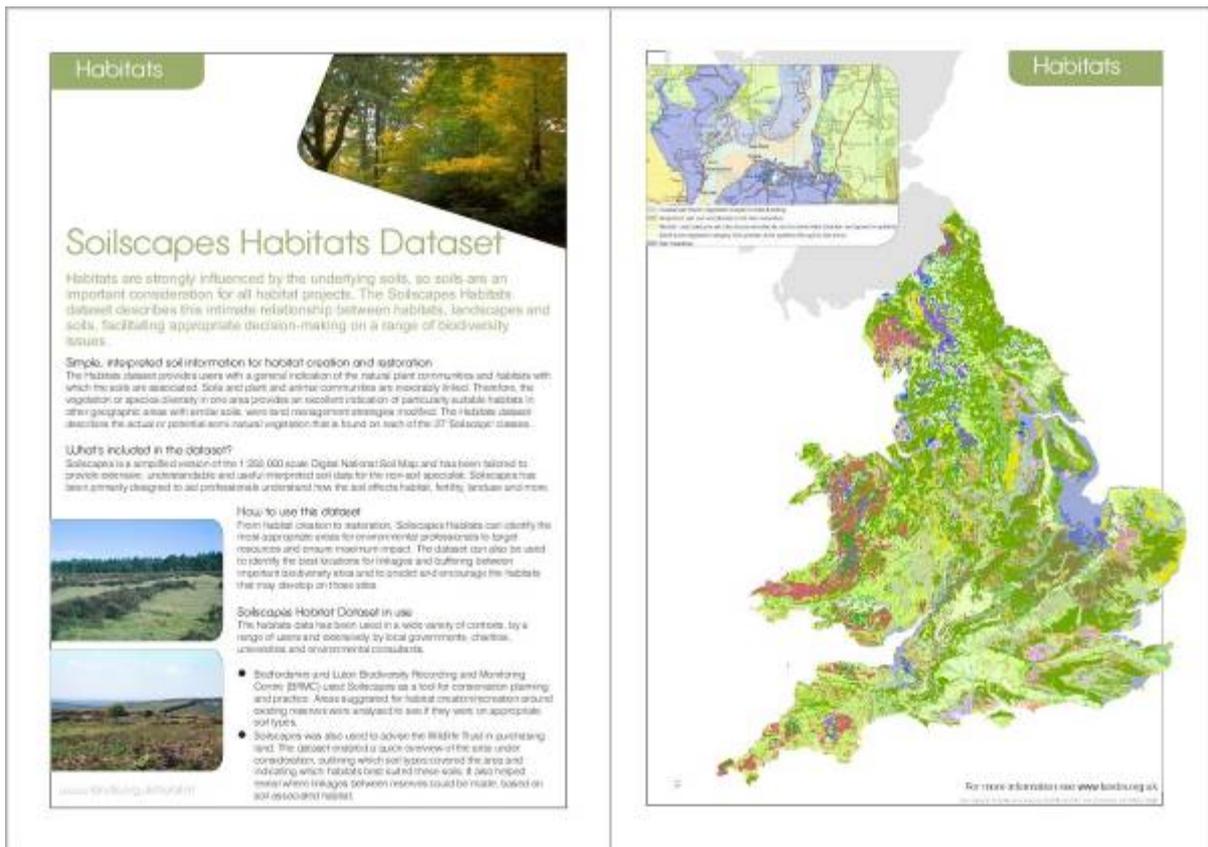


Figure 5 Sample of new data descriptions

## Enquiry desk

The LandIS enquiry desk continues to advise users as to usage of of the raw and interpreted soils data and as to the best products for their purposes. This is handled in three ways: by e-mail, by telephone and now via a new frequently asked questions 'FAQ' section on the new-look LandIS website (<http://www.landis.org.uk/faq>).

## New Soil Structure Maps

Following an enquiry from a client who requested a digital version of the Stability of Topsoil Structure map, we undertook an investigation into the original models used to derive this map so we could reproduce it in the contemporary information system. The original map was generated for a Defra project "SP0305: "A National soil vulnerability-based framework for

provision of farm-specific guidance on the management of soil structure” following this project a NSRI did a project with Birds Eye to further improve the models. The improved models are driven by the soil topsoil texture, calcareous status, organic matter levels and wetness class. The first stage of this map regeneration was therefore to check the classification of the soil series for these properties. As a result we have also created a new Soil Topsoil Texture product (see Figure 6). The new models provide maps showing: Susceptibility to topsoil slaking, susceptibility to compaction, potential for natural regeneration following compaction and the potential for successful mechanical rectification of compaction (see Figures 7-10). The work was funded by the client as part of the preparation fee for their licence of the data but new datasets and functions were derived which we consider could be part of LandIS and made available to Defra. Although the preliminary investigation of this work has now been done, it will be necessary to properly assess the results before the data can be made generally available. We would appreciate guidance from Defra on whether these products are of interest to them.

Unfortunately while doing this exercise it was noticed that the map on page 5 of “A Guide to Better Soil Structure” which shows the ability to recover from structural damage has a printing error and the Very slow and Rapid classes have been transposed. As this publication is a popular and well used document it may be necessary for Defra to consider republishing the document, either by: producing a single page addendum; fixing the online PDF version only; republishing the printed document or just making sure Defra consultants are aware of the mistake and give advice accordingly. If Defra are interested it could be possible to revisit these maps in the light of the Birds Eye project and to produce new revised maps for a second edition of the publication.

## Dominant Topsoil Texture

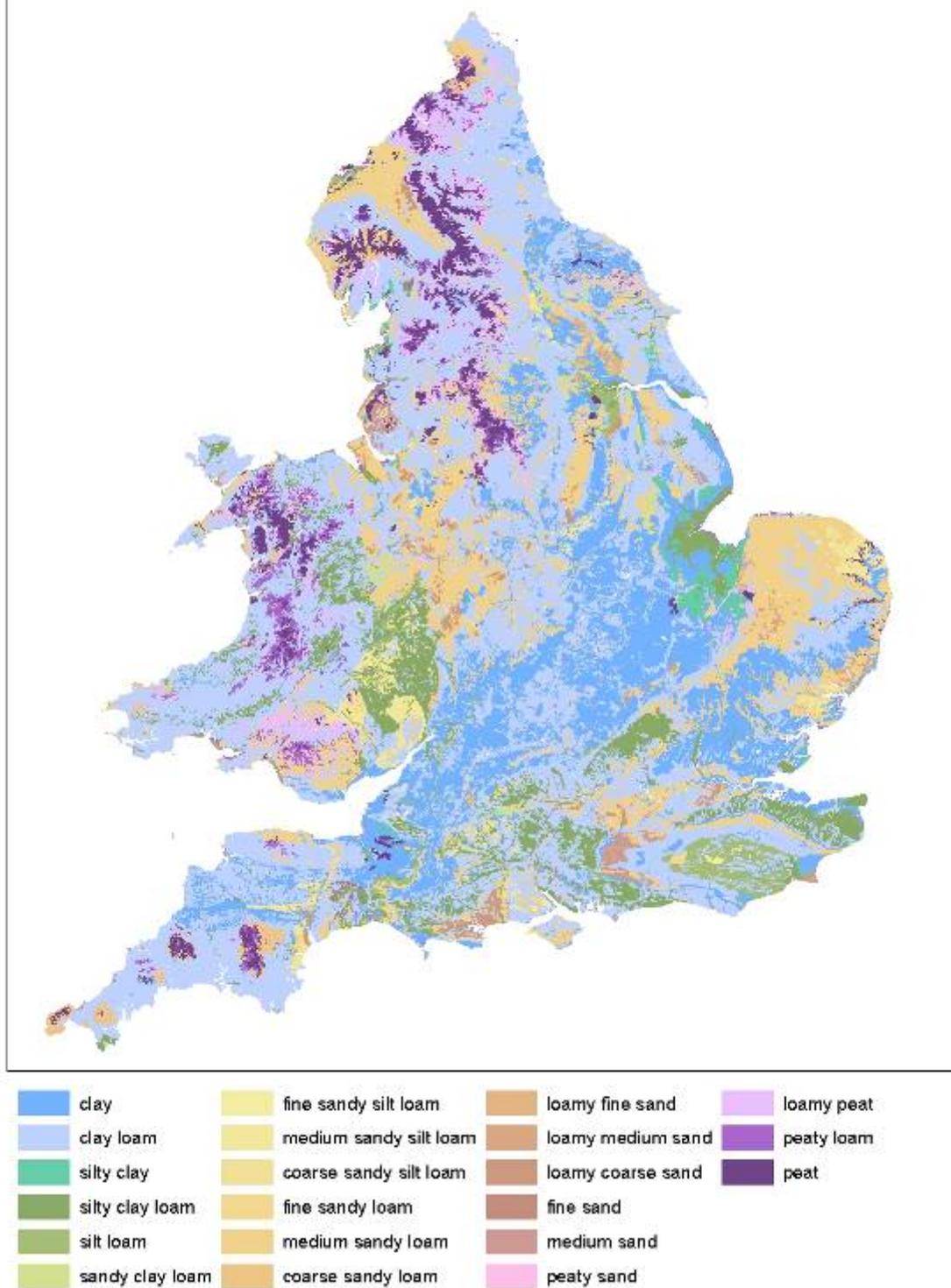
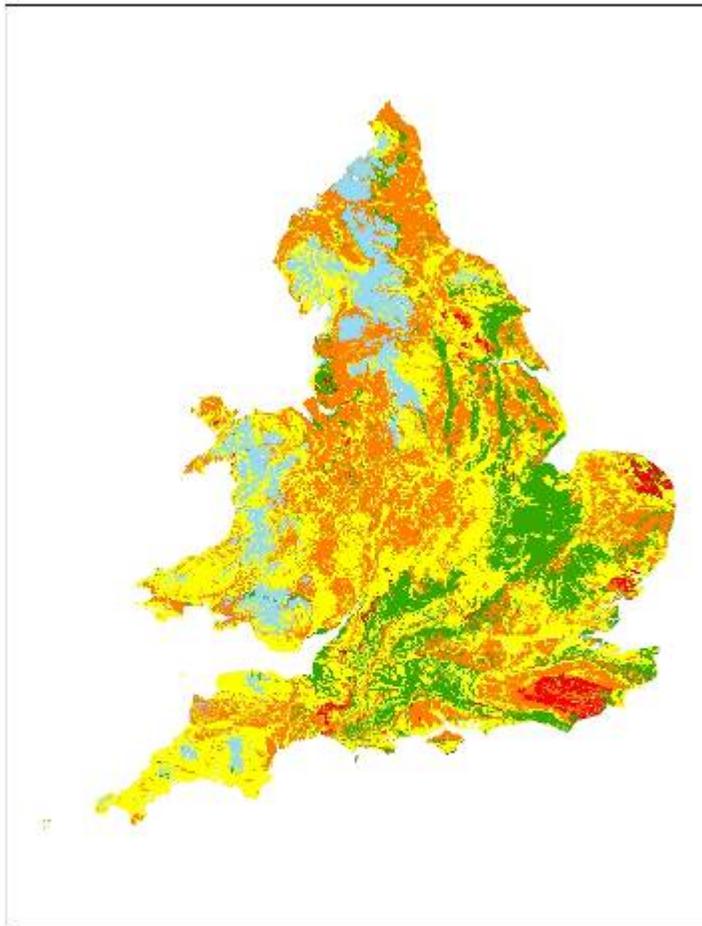
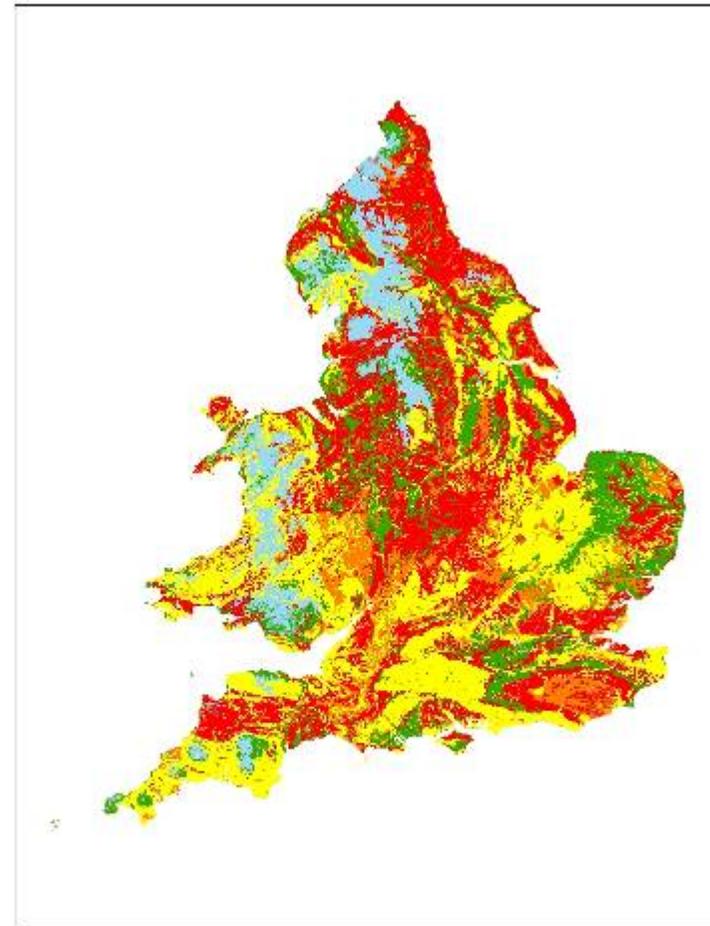


Figure 6 Dominant Topsoil Texture



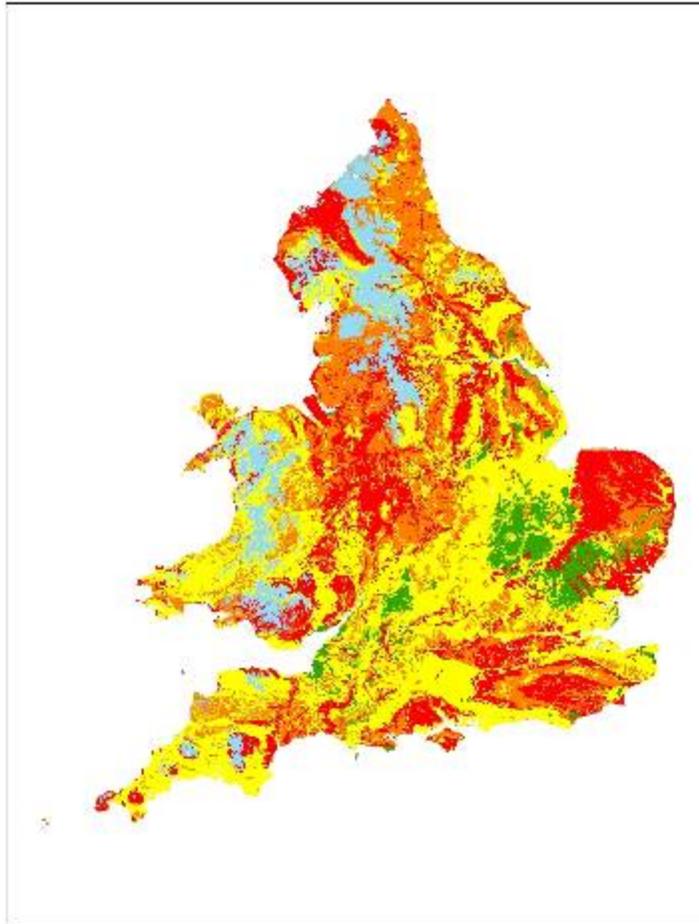
**Susceptibility to Topsoil Slaking**  
 Very Unstable  
 Unstable  
 Moderately stable  
 Stable  
 NA

**Figure 7: Susceptibility to topsoil Slaking**



**Susceptibility to Compaction**  
 Very susceptible  
 Moderately susceptible  
 Slightly susceptible  
 Very slightly susceptible  
 NA

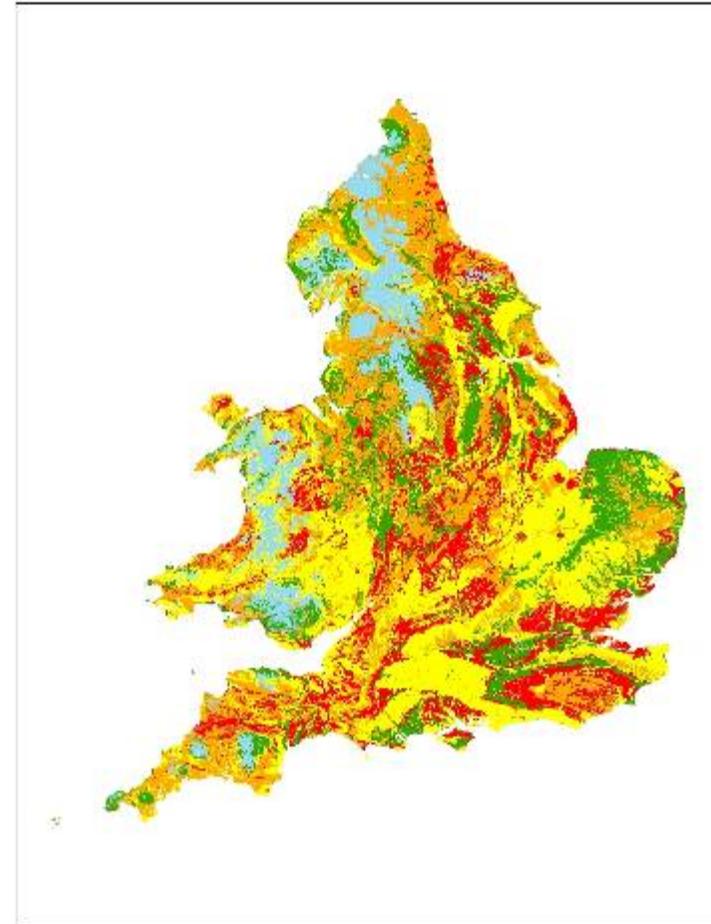
**Figure 8: Susceptibility to Compaction**



Potential for natural regeneration of structure following compaction

- Little potential
- Slight potential
- Potential
- Large potential
- NA

Figure 9: Natural Regeneration



Success of mechanical rectification of compaction

- Easy
- Moderately easy
- Moderately difficult
- Difficult
- NA

Figure 10: Mechanical Rectification

### **LandIS PERSONNEL/TIME**

Time put down to the LandIS project for the period Apr 09 to Jun 09 with budgeted days for Year 3 (Apr 09 to Mar 10) in brackets:

Caroline Keay	13.6	(58) days
Timothy Farewell	10.9	(50) days
Stephen Hallett	5.4	(20) days
Andrew Rayner	22.1	(50) days

### **Defra budget used between 1<sup>st</sup> April 2009 and 30<sup>th</sup> June 2009**

£3,050 was spent from a budget of £5,800 for 10 Defra projects.

The 6 data leases marked with a \* were deferred from last years budget until the beginning of April 2009.

To enable the continuation of free, on-demand access to the soils data by Defra and its contractors, we suggest that if the spend reaches £5,000, and there is more than two months remaining in the funded period (i.e. prior to 31<sup>st</sup> March 2010) we arrange an invoice for an additional £2000 to cover any additional requests. We would appreciate your view on this suggestion.

**NEW DATA LEASES FOR THE YEAR TO DATE**

Organisation	Abstract	Purpose of Use	Start Date	End Date	P&A	Uncharged Royalty
<b>Data Lease funded by DEFRA via the LandIS fund</b>						
NERC / CEH*	1km resolution soil carbon database for England and Wales, giving the soil series in each 1km square together with particle size, bulk density and carbon content for layers 0-30cm and 30-100cm	To be used by CEH (Edinburgh) for DEFRA Project on Preparation of Annual Greenhouse Gas Inventory for LUCF in the UK	01-JUN-08	31-MAY-10	£200	£50,000
Forestry Commission*	NSI data points - DEFRA contract SP0521.	Forestry Commission research project EH66600E 'Carbon dynamics in forests'.	11-OCT-08	10-OCT-09	£200	£97,000
University of Stirling*	NATMAP vector, NSI topsoil, SOILSERIES hydrology, SOILSERIES pesticides.	Defra project: FC1177 "Development of a risk evaluation system for the establishment of Gyrodactylus salaris in English and Welsh river systems."  Data to be used by David Morris.	23-FEB-09	22-FEB-10	£375	£112,000
Forestry Commission*	NATMAP vector - Breckland Forest area	Data to identify heathland areas and for use in forestry planning	25-FEB-09	21-FEB-14	£375	£3,000
Maslen Environmental*	Soilscapes for England and Wales.	Defra R&D project SP0573: Basis of the UK BAP target for the reduction in use of peat in horticulture  Development of a map showing lowland raised peat bogs where the peat deposits have historically or are currently being extracted.	02-FEB-09	01-FEB-10	£375	£38,525
Environment Agency*	NSI Carbon/texture data Soil C (%)	DEFRA project SP0562 - 'Co-ordinate an expert group to assemble UK-wide data on soil carbon (and greenhouse gas fluxes) in the context of land management).	19-JAN-09	18-JAN-10	£375	£2,400
NERC / CEH	NATMAP1000 1 km digital raster version of the National Soil Map for England and Wales, (Ref: DD7017V/033, ID210)	to update critical loads maps for DEFRA/NERC contract EPG1/3/185: National Critical Loads Mapping Programme - Phase IV (CEH project - CPEA 19	17-SEP-07	16-SEP-10	£200	£14,128

Organisation	Abstract	Purpose of Use	Start Date	End Date	P&A	Uncharged Royalty
Peak Districk National Park Authority	NATMAP, SOILSERIES hydrology, agronomy, pesticides, info, HORIZON fundamentals, hydraulics.	DEFRA research project SP0572 - Ecosystem Services of Peat. 2-5 users.	23-MAR-09	22-MAR-10	£375	£5,801
BBSRC	County-level soil property data defining, for the 3 most common soil types present: maximum organic carbon content(%); minimum soil organic carbon content (%); clay content (%); pH; bulk density (g/cm3); total soil porosity (% volume); water content at field capacity (1/3 bar tension) as a % of total water content at wilting point (15 bar tension) as a % of total porosity, of the topsoil layer; together with soil texture class and Hydrology Of Soil Types (HOST) grouping.	For use solely as input data to any version of the UK-DNDC model for the purpose of deriving emission factors for the UK N20 inventory as required by the Department of the Environment, Food and Rural Affairs (Defra). Ref: DEFRA project code: CC0266. 2008 - same project but code changed to AC0101. 2009 - DEFRA AC0112: Inventories of ammonia and greenhouse gases from UK agriculture	01-APR-09	31-MAR-10	£200	£66,029
DEFRA	Soilscapes data.	DEFRA project ref: IF0128. The potential impact of Climate change on diseases influencing the UK strawberry industry.	19-MAY-09	30-APR-11	£375	£24,078
				TOTAL (Defra Charges)	£3,050	£412,961

Organisation	Abstract	Purpose of Use	Start Date	End Date	P&A	Uncharged Royalty
<b>Bona Fide Research</b>						
University of Brighton	National Soil Map soil associations for the South East of England with text legend file  2/4/09 - Additional data supplied. MUSID - horizon and agronomy properties summarised	For a research and development project on Habitat Suitability Modelling on the South Downs	23-MAR-09	22-MAR-10	£375	£4,993
University of East Anglia	Digital version of the 'stability of topsoil structure' map.	Research project - RELU Biomass project team - increased biomass crop planting.  2-5 users.	15-JUN-09	14-JUN-11	£600	£24,000
University of Sheffield	NATMAP vector, SOILSERIES hydrology & agronomy, HORIZON fundamentals & hydraulics.	Non- commercial use. For Bona-fide research purposes. Project: 'Impact of catchment landscape structure on water quality variability' funded by Marie Curie fund. Small multi-user - 2-5 people.	25-MAY-09	24-MAY-12	£375	£87,697
TOTAL (Bona fide Research)					£1,350	£116,690