

Summary of findings

Irish Soil Information System

EPA Research Report No. 130

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Lead Organisation: Teagasc

Short Summary:

Soil formation is dependent upon geology, climate, vegetation, altitude, landform shape and finally management over time. The soil landscapes we see in Ireland today are a consequence of the changing climatic conditions over the last 100,000 years (with periods of glaciation, the last of which was 12,000 years ago) and the management of land by farmers. Using information about the geology, climate, landform and vegetation, this project has been able to develop the key relationships found between soils and these key factors in Ireland and uses it to predict areas of soils that had not been previously mapped in detail (i.e. by the original soil survey (An Foras Talúntais (AFT)) which took place between 1950s and 1990s and covered c. 44% of Ireland). This work was followed up by a 2.5-year field survey describing the soils found in previously unmapped areas. The final product is a national soils map at the 1:250,000 scale, derived from a unique combination of new and traditional methodologies and soils data from both the AFT and the ISIS project; and an associated soil information system which will be available to all the AFT and the ISIS project; and an associated soil information system which will be available to all.

Key Words:

Soil classification, predictive soil mapping, soil profiles, national soil map.

Background:

The information available on soil is currently not sufficient and it is vital to improve our evidence base to provide information and guidance to policy and decision makers (EPA, 2012 State of the Environment). Comparison of soil information at European scale has led to the requirement for the harmonisation and coordination of soil data across Europe. The first soil maps of Ireland, in the form of detailed county maps, were produced in the 60's and 70's, by AFT. However, only 44% of the country was covered. A General Soil Map of Ireland was published by Gardner and Radford in 1980 which provided a general description of the soils of Ireland. Following an EPA-funded project which developed a soils geochemical database for Ireland (Fay et al, 2009), the EPA commissioned a detailed analysis of soils information available in Ireland (Daly and Fealy, 2007), which identified the need for a national soil mapping project. The Irish Soil Information System (ISIS) project was established in 2008. The ISIS project was funded under the EPA Research programme and co-funded by Teagasc. It was led by Teagasc with the participation of researchers from Cranfield University (UK) and University College Dublin. The overall objective of the ISIS project was to conduct a programme of structured research into the national distribution of soil types and construct a soil map, at 1:250,000 scale, which will identify and describe the soils according to a harmonised and coherent national legend.

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Key points:

- Contributions to developments internationally in soils research.
- Advancement of national capacity in the soils thematic area.
- Creation of a common framework for the provision of soil data, to maximise the stakeholder benefit to be derived from this data.
- This project has created a new digital national soil map for Ireland at a scale of 1:250,000.
- The ISIS project has optimised a combination of new technology (predictive mapping) and traditional ground-truthing (survey) by adopting a combined methodology of utilising novel geo-statistical predicted mapping techniques in tandem with traditional soil survey applications.
- 225 soil profile pits have been sampled and described as part of this project, providing a good overview of the major soil types found in Ireland.

Findings/Recommendations

The ISIS project adopted a combined methodology of utilising novel geo-statistical predicted mapping techniques in tandem with traditional soil survey applications. Building upon the detailed work carried out by the AFT survey, the ISIS project generated soil-landscape models at a generalised scale of 1:250,000 for the counties of Carlow, Clare, Kildare, Laois, Leitrim, Limerick, Meath, Offaly, Tipperary South, Waterford, Westmeath, Wexford, West Cork, West Mayo and West Donegal. These soil-landscape models were used as the baseline data for statistical models to predict soil map units in counties where there was no map available. To validate the methodology, a 2.5-year field survey was conducted. Where new soil information was generated, due to previously unknown combinations of soil-landscape units, profile pits were selected at representative locations across the country. These 225 pits were described and sampled in detail and were used to generate a new soil classification system for the country. The final soil map of Ireland consists of 58 soil mapping units (excluding areas of alluvium, peat, urban, rock or marsh). All the representative profile information is available in the online soil information system.

Further Information:

Check out the project website: <http://soils.teagasc.ie>. This provides information on the map, soil data available, reports describing the project and contact information for project partners.

This report is published as part of the EPA Research programme on the website <http://goo.gl/5i3Wr0>. The full Final Technical reports are published by the EPA and are available from: <http://erc.epa.ie/safer/reports>