



wossac[®]

www.wossac.com

**Cranfield University's
International Soils Archive**

Professor Stephen Hallett, Dr Ian Baillie
Bob Jones, Brian Kerr, Wayne Borden,
Edwin Vera

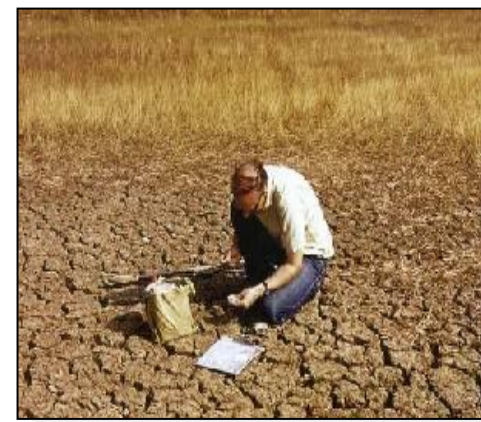
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THE QUEEN'S
ANNIVERSARY PRIZES
FOR HIGHER AND FURTHER EDUCATION
2015 & 2017



What is WOSSAC?



Soil Classification

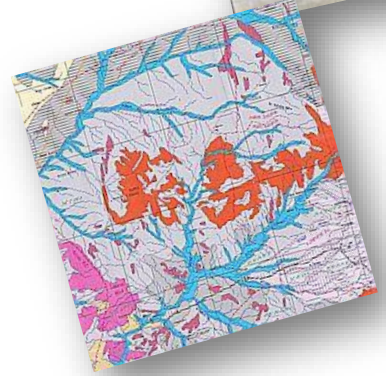
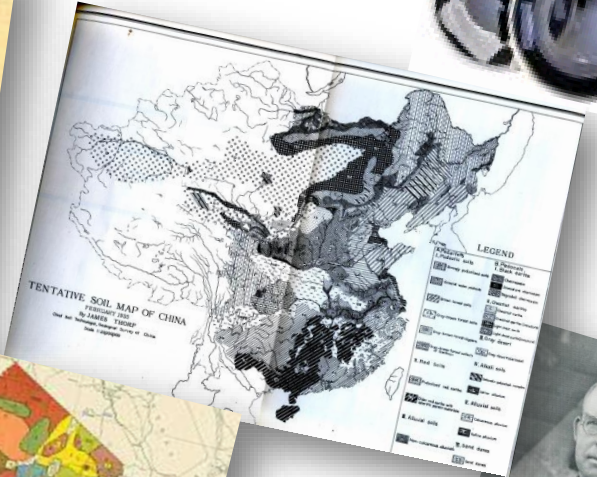
Soil Class	Soil Type	Area
1	1.1	1.1
2	2.1	2.1
3	3.1	3.1
4	4.1	4.1
5	5.1	5.1
6	6.1	6.1
7	7.1	7.1
8	8.1	8.1
9	9.1	9.1
10	10.1	10.1
11	11.1	11.1
12	12.1	12.1
13	13.1	13.1
14	14.1	14.1
15	15.1	15.1
16	16.1	16.1
17	17.1	17.1
18	18.1	18.1
19	19.1	19.1
20	20.1	20.1
21	21.1	21.1
22	22.1	22.1
23	23.1	23.1
24	24.1	24.1
25	25.1	25.1
26	26.1	26.1
27	27.1	27.1
28	28.1	28.1
29	29.1	29.1
30	30.1	30.1
31	31.1	31.1
32	32.1	32.1
33	33.1	33.1
34	34.1	34.1
35	35.1	35.1
36	36.1	36.1
37	37.1	37.1
38	38.1	38.1
39	39.1	39.1
40	40.1	40.1
41	41.1	41.1
42	42.1	42.1
43	43.1	43.1
44	44.1	44.1
45	45.1	45.1
46	46.1	46.1
47	47.1	47.1
48	48.1	48.1
49	49.1	49.1
50	50.1	50.1

It is to be hoped that this map will be of use to the farmer and the landowner, and that it will be a help to the student of soil science.

A Soil Map of Great Britain

E. M. BRIDGE

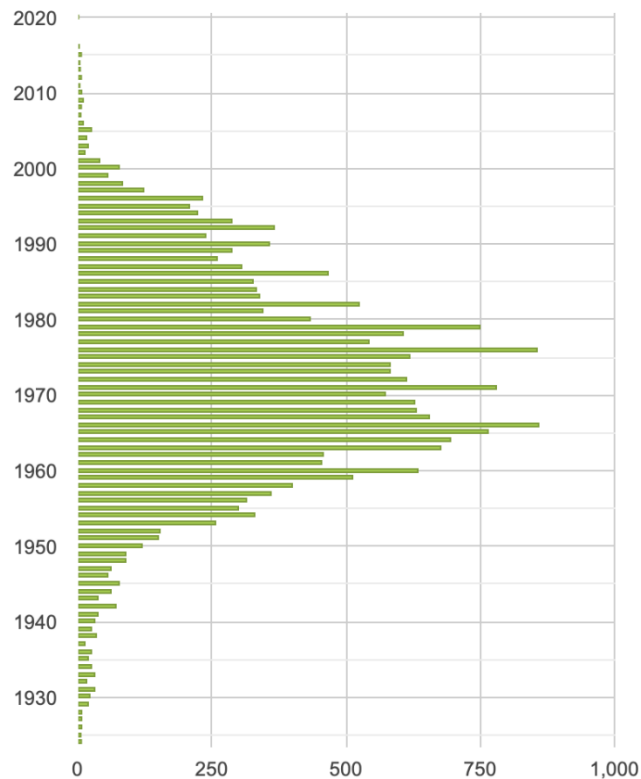
A volume translated in British terms to the farmer in the form of a soil map. This map, based on the 'Preliminary Atlas of Pedology' (1927) is the result of a systematic and it would be hard to overstate the value of the soil map to the farmer and the landowner, and to the student of soil science. It is a volume translated in British terms to the farmer in the form of a soil map. This map, based on the 'Preliminary Atlas of Pedology' (1927) is the result of a systematic and it would be hard to overstate the value of the soil map to the farmer and the landowner, and to the student of soil science.



Archive holdings

Summary of the archive items shown by survey date

An interactive chart of the dates of the 25,547 catalogued items



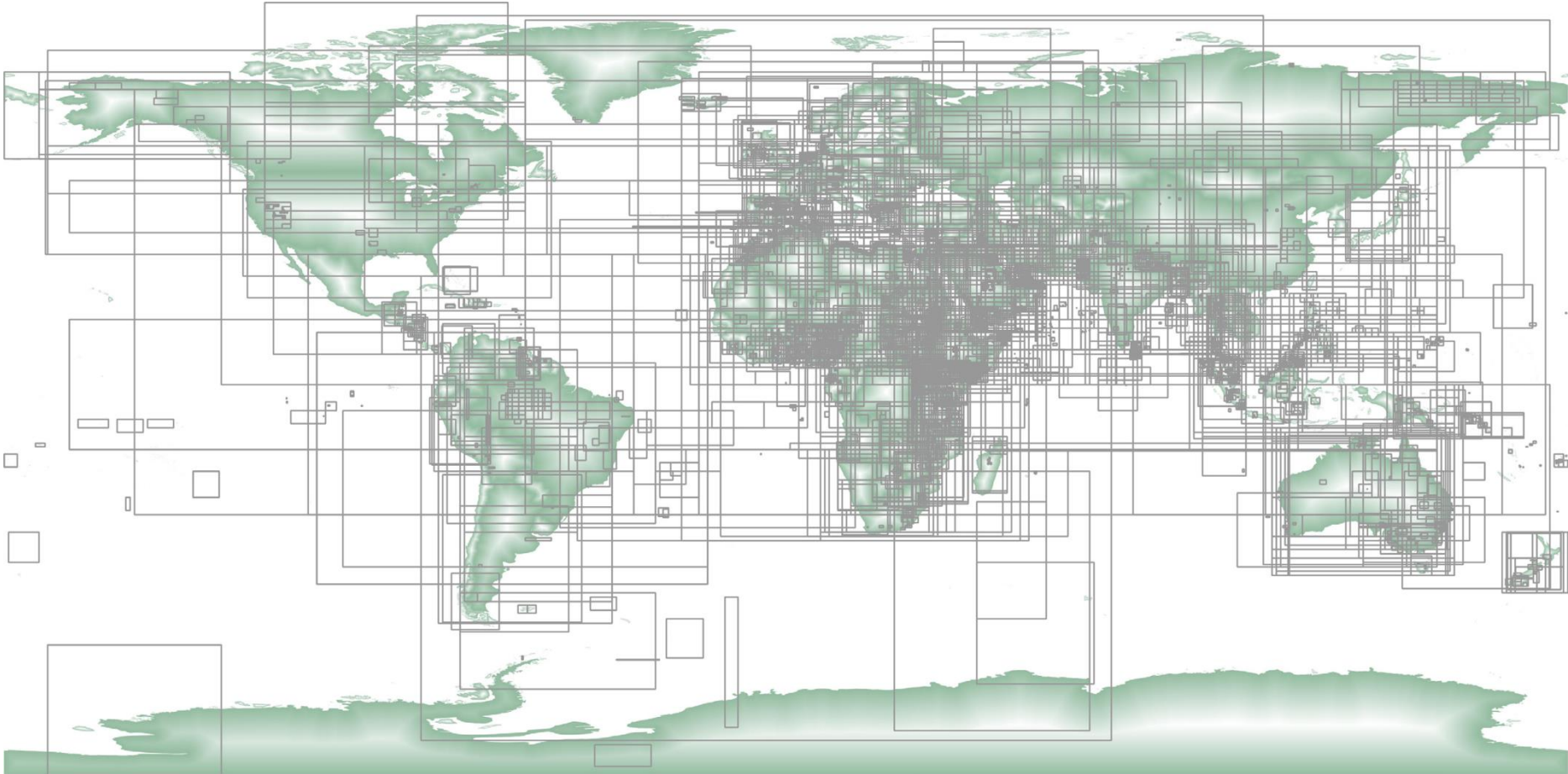
25,547 items now catalogued

12,213 georeferenced maps

73+ Contributors – organisations and individuals

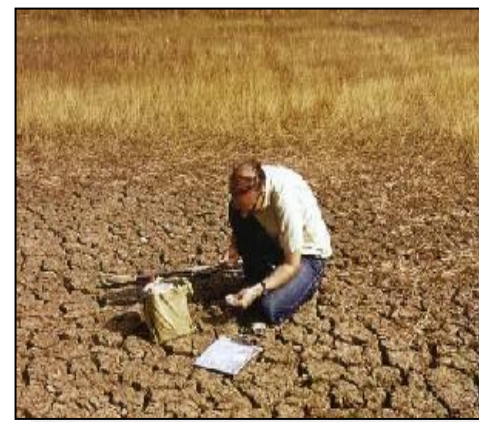
Representing items from 373 + territories

Archive holdings



Background

- Substantial numbers of **soil and land surveys** were made worldwide by British companies over the past 80 years. Some **373 territories** represented in collection
- Surveys were originally sponsored by development assistance donors & government departments and **74** contributors
- There are in WOSSAC many thousands of survey volumes and maps (**25,547 items catalogued**)
- At today's prices would have cost well over £200 million
- Soil surveys not likely now to be repeated
- Extremely **valuable bank of international data** about soils, their nature, properties and potential use
- Current volumes may represent **only existing information** about the soils in many of the countries of the world
- Materials in WOSSAC had been in danger of being destroyed and lost



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Applications

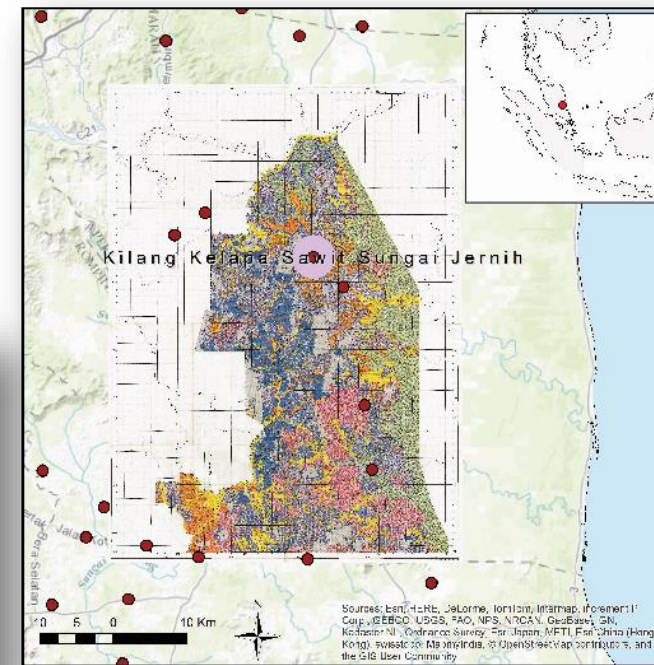
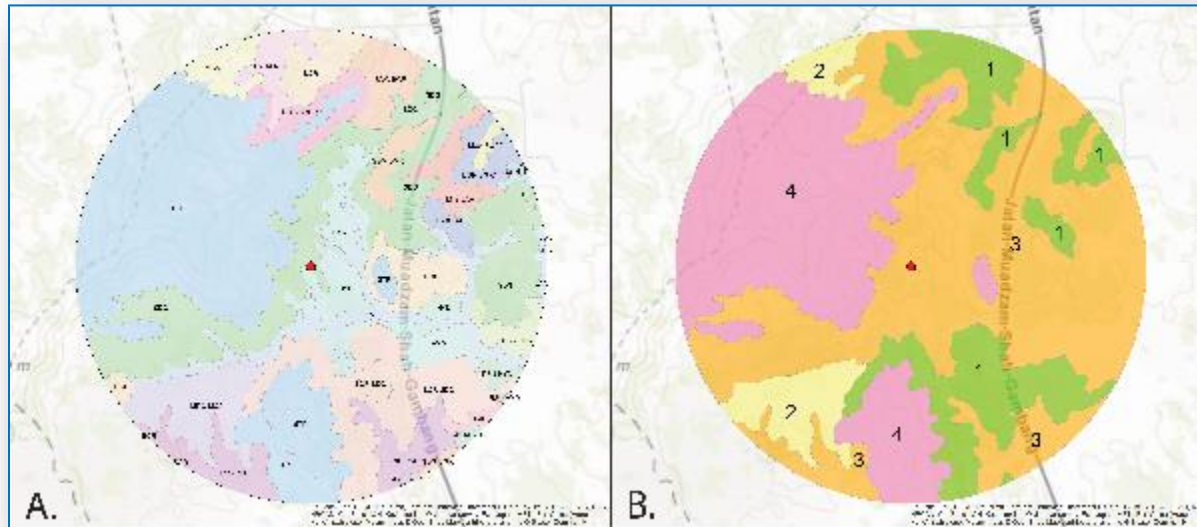
WOSSAC materials can play a role in a range of contemporary and pressing environmental issues

- Supporting the UN Sustainable Development Goals (SDG)
- Undertaking natural land and resource inventory
- Land capability assessment
- Land degradation studies
- Soil survey
- Satellite ground-truthing in fragile states
- Longitudinal environmental research
- Regional appraisal
- Disaster relief and aid planning
- Soil management
- Optimal land use suitability
- Food security
- Combating desertification
- Water use planning
- Identifying runoff
- Infiltration and water storage zones
- Waste management
- Carbon sequestration studies



**SUSTAINABLE
DEVELOPMENT
GOALS**

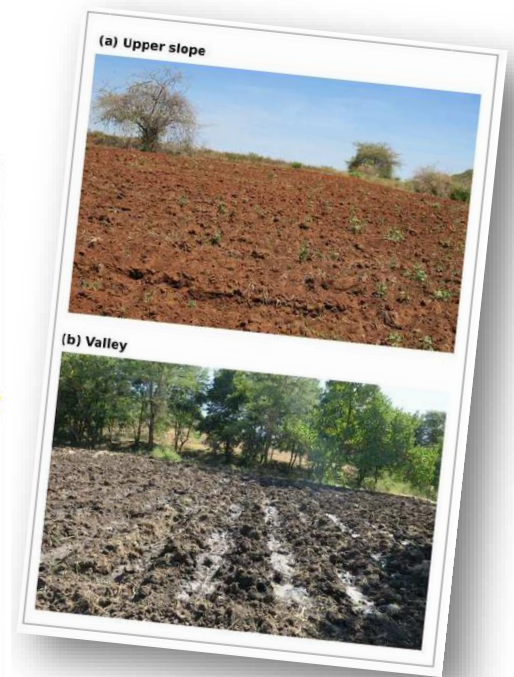
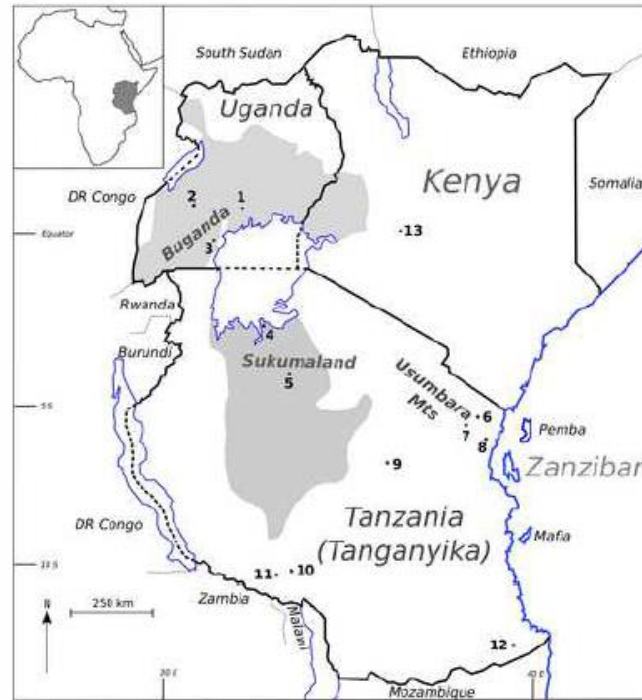
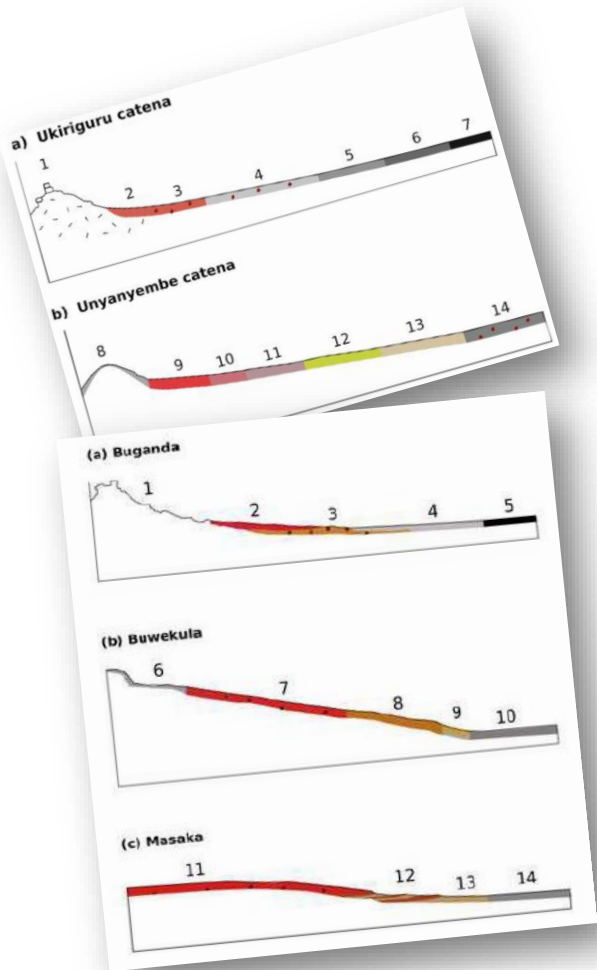
Case study application – Oil Palm



Hallett, S.H., Sakrabani, R., Keay, C.A. and Hannam, J.A. (2017) Developments in land information systems: examples demonstrating land resource management capabilities and options. *Soil Use and Management*. Volume 33, Issue 4, December 2017, Pages 514–529 doi: 10.1111/sum.12380. Accessed at <http://onlinelibrary.wiley.com/doi/10.1111/sum.12380/full>.



Case study research – Catenas



The East African contribution to the formalisation of the soil catena concept
 R. W. Borden*, Ian C. Baillie†, Stephen H. Hallett†

* School of Water, Energy and Environment, Cranfield University, MK43 0AL, UK
 † Corresponding author, School Building 55, Cranfield University, MK43 0AL, UK
 Email address: r.borden@cranfield.ac.uk

Highlights

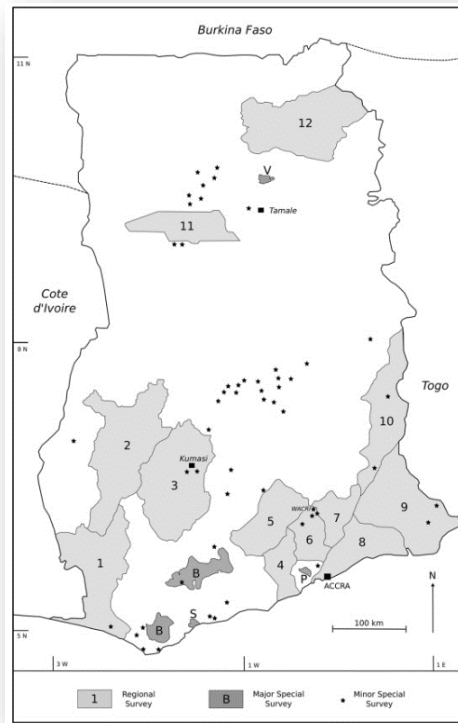
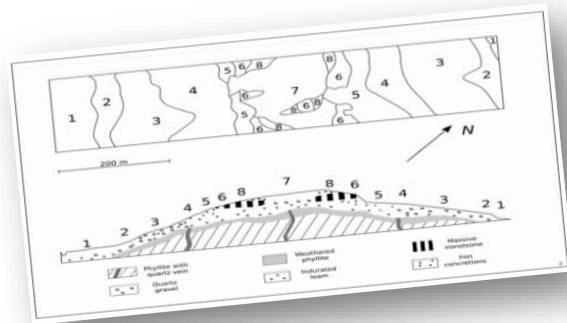
- The catena describes how soils vary with slope position.
- The concept was developed in East Africa in the 1930s by Mire and his colleagues.
- It was widely adopted and is still much used in soil and other sciences.
- This inevitably led to some broadening in definition.
- The concept is applied in savannas and also in other, wetter and cooler biomes.

Abstract

The concept of the soil catena was first explicitly formalised by Geoffrey Mire and his colleagues in East Africa in the 1930s. It has been widely adopted and applied in soil science and continues to be of great value in soil and other field sciences. The concept describes widespread patterns in which distinctive associations of soil and vegetation are consistently located in specific slope positions. The formalisation of the concept in an area well outside the mainstream of soil research appears to have been due to the combination of highly visible recurrent patterns of red slope soils overlooking dark valley floors in East African extensive savannas, together with a group of receptive and collaborative soil scientists in the institutional environment. The concept is now widely used in savannas and also in other, wetter and cooler biomes. We show that several

Borden, R.W., Baillie, I.C., Hallett, S.H. (2019) The East African contribution to the formalisation of the soil catena concept. *Catena*. doi.org/10.1016/j.catena.2019.104291. Accessed at <https://www.sciencedirect.com/science/article/pii/S0341816219304333>

Case study research – C.E. Charter



Borden, R.W., Brammer, H., Baillie, I.C., Hallett, S.H. (2021) The contributions of C. F. Charter to tropical soil survey and classification. 197. *Catena*. doi.org/10.1016/j.catena.2020.104957. Accessed at <https://www.sciencedirect.com/science/article/pii/S0341816220305075>

Stakeholders

WOSSAC materials are of interest to a broad range of end-users and stakeholders

- Policy makers
- Planners
- Development NGOs
- Land managers
- Agriculturalists / Agronomists
- Scientists and Researchers
- Students
- Public



History

- British Society of Soil Science (BS3) funded 2 initial pilot projects at Cranfield, backing University investment
- Project commenced 2004
- Recruited dedicated staff as well as body of existing volunteer and paid workers



2004

HTSPE Ltd.

- Major development was the 2005 inclusion of HTSPE Collection
- 3,500+ Reports and associated maps
- 3,000+ Individual maps
- Extensive Map albums
- 7,000+ Satellite Images
- Funding for catalogue to be made of materials



2005



HTSPE Premises affected by Buncefield Oil disaster 11/Dec/05 – fortunately by then HTSPE materials were safely in WOSSAC!

Building B121 – a new home for WOSSAC



June 2021: A new £3.2 million Agri-informatics facility was officially opened at Cranfield University by Rt Hon. George Eustice MP, the Secretary of State for Environment, Food and Rural Affairs.

Cranfield and its partners will use the facility, shared with Agri-EPI Centre, to create innovative informatics to support novel business, management and policy approaches in the agricultural sector. The new facility is the new home of the National Reference Centre for Soils and associated land information system, LandIS. The facility is also the new home for the WOSSAC archive.

WOSSAC Holdings



Maps
Surveys
Reports
Books
Imagery
Photos...



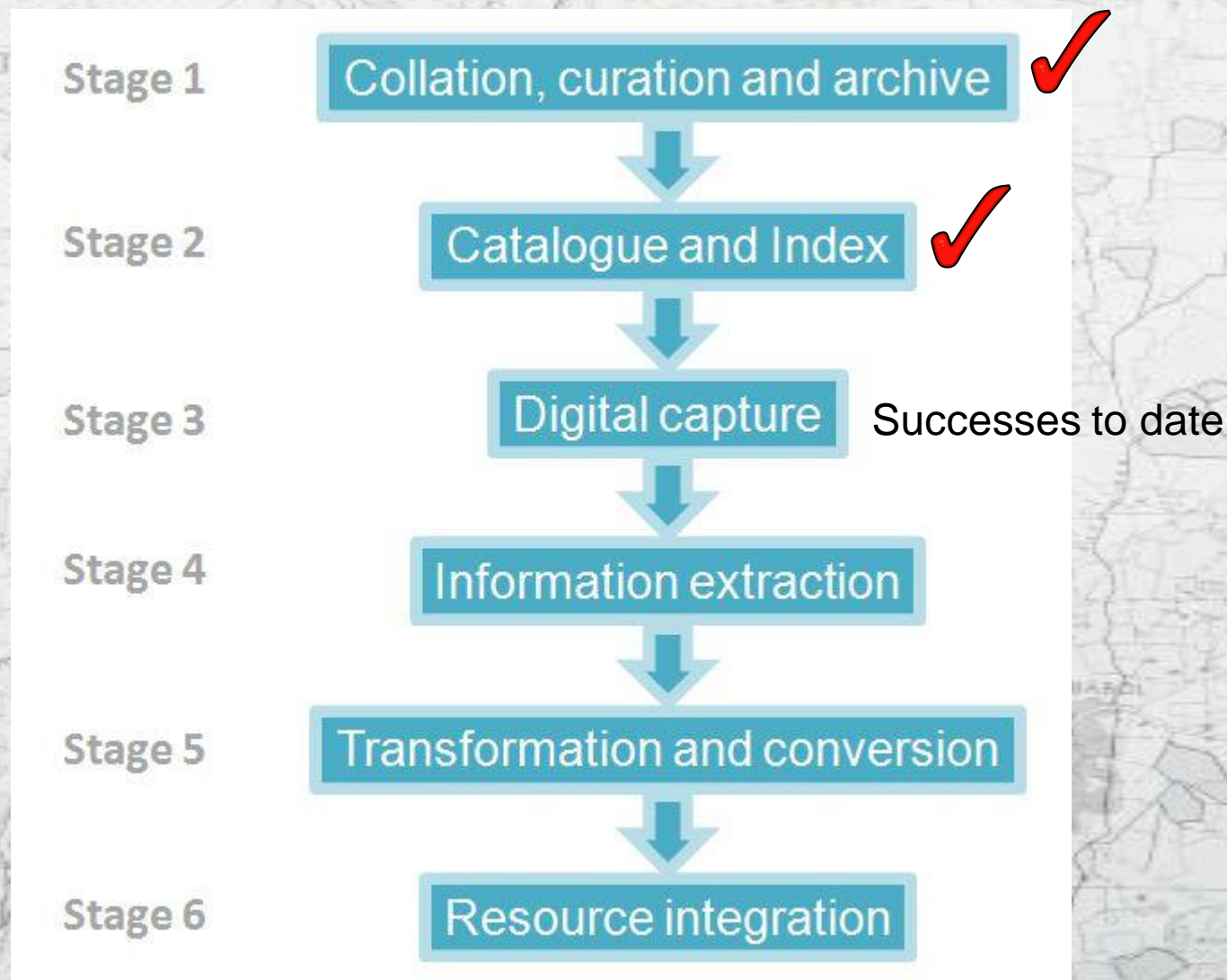
Soil Survey
Land Use
Natural Resource
Topographical
Socio-economic
Cadastral

SoilPIC



- ‘Wiki’-based repository of soil profile and landscape photography
- Dedicated website
<http://www.soilsworldwide.net>
- Many thousands of existing slides now scanned; tens of thousands more to come

WOSSAC Programme



WOSSAC – Data Capture

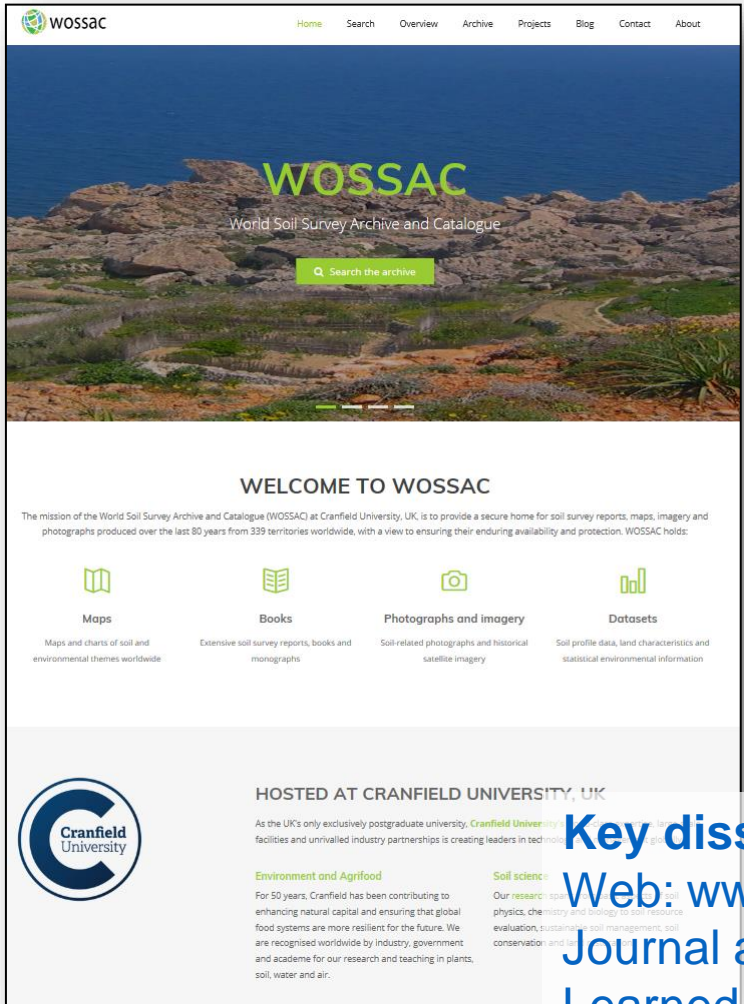


'Ecosystem Services Databank and Visualisation for Terrestrial Informatics'(NE/L012774/1)

NERC-supported project allowing researchers and students to access, share and interact with all the natural resource, soil and land-related materials gathered from around the world in the 'World Soil Survey Archive and Catalogue', WOSSAC (www.wossac.com)



Archive Web Access



Archive items now recorded in central catalogue database, searchable on web

Quick catalogue search - Results

New Search There were 24 hits returned

Item	Title	Date	Country (Old name)	Keywords
4143	Kagera River Basin Development - Phase 2 Prefeasibility Studies. Kyka Irrigation Project	1976	Tanzania	Soil survey, Hydrology, Agriculture, Irrigation
4144	Kagera River Basin Development - Phase 2 Prefeasibility Studies. Nkaka Livestock Project	1976	Burundi	Agriculture, Livestock
4145	Kagera River Basin Development - Phase 2 Prefeasibility Studies. Nyamuswaga Reclamation Project	1975	Burundi	Soil survey, Hydrology, Land classification, Land use, Agriculture
4146	Kagera River Basin Development - Phase 2 Prefeasibility Studies. Reclamation of the Bukumba, Kajai and Kankuma Valleys	1976	Tanzania	Soil survey, Hydrology, Land classification, Land use, Agriculture
4147	Kagera River Basin Development - Phase 2 Sectoral Studies. General Agriculture	1976	Tanzania	Agriculture
4148	Kagera River Basin Development - Phase 2 Sectoral Studies. Human Infrastructure	1976	Tanzania	Agriculture, Land use, Infrastructure
7152	KAGERA RIVER BASIN DEVELOPMENT PHASE 2 Prefeasibility Studies: Buyongwe Reclamation Project	1976	Rwanda	Climate, Hydrology, Soils, Land Use, Agriculture, Yield, Crop, Development,
14172	Mineral survey of selected areas of Rwanda Airborne geophysical survey	1975	Mozambique	Geophysics
14173	Mineral survey of selected areas of Rwanda Airborne geophysical survey	1975	Mozambique	Geophysics
19818	Carte Geologique du Congo Belge et du Ruanda-Urundi	1950	Democratic Republic of the Congo (DRC); Rwanda (Congo Belge et Ruanda-Urundi)	Geological map of the Belgian Congo and Rwanda
19819	Carte Lithologique du Rwanda	1963	Rwanda	Geological map of Rwanda



Key dissemination routes

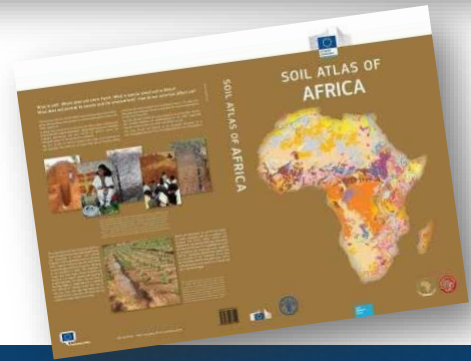
Web: www.wossac.com

Journal articles

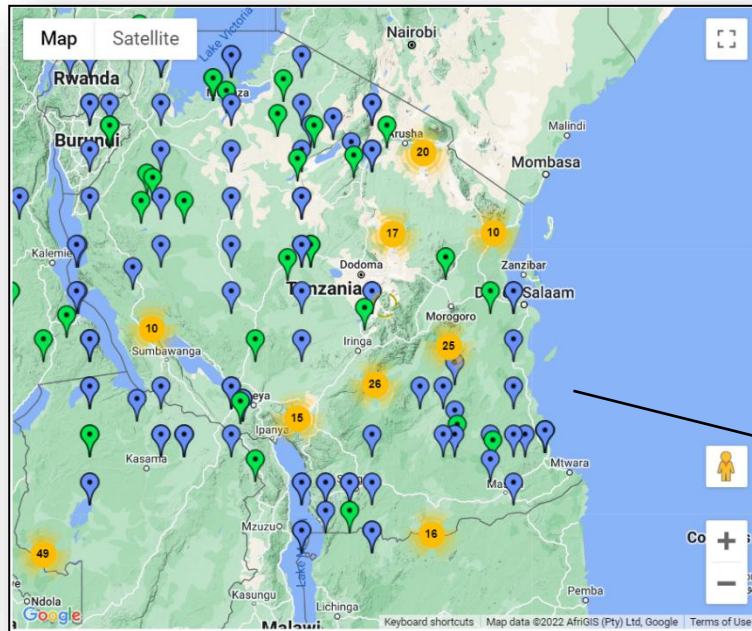
Learned Society Bulletins

Expert users network

African Soil Atlas



Map searches of holdings



Simple dynamic overview map with item detail summary and access if digitised

Overview Internet mapping tool

Q Item detail - Results

New Search

<< < > >>

Item ID	35966
Collection reference:	(624)
Title:	First Population Census of Sudan 1955-56: Asmara
Subtitle:	Location of Omodias
Language:	English
Publication Date:	1959
Publisher's Name:	Sudan Survey Department
Place of Publication:	Khartoum
Material(s) accompanying:	Item 35962, 35963, 35964, 35965, 35966, 35967, 35968, 35969, 35970, 35971, 35972, 35973
Material Type:	Paper Map
Summary Abstract:	First Population Census of Sudan 1955-56: Asmara
Country Now:	Sudan
Nearest City:	Khartoum
Northernmost Latitude (decimal degrees):	16
Southernmost Latitude (decimal degrees):	12
Easternmost Longitude (decimal degrees):	42
Westernmost Longitude (decimal degrees):	36
Map Sheet:	ND-37
Map Scale:	1000000
Document File:	35966.jpg (7.85 Mb)

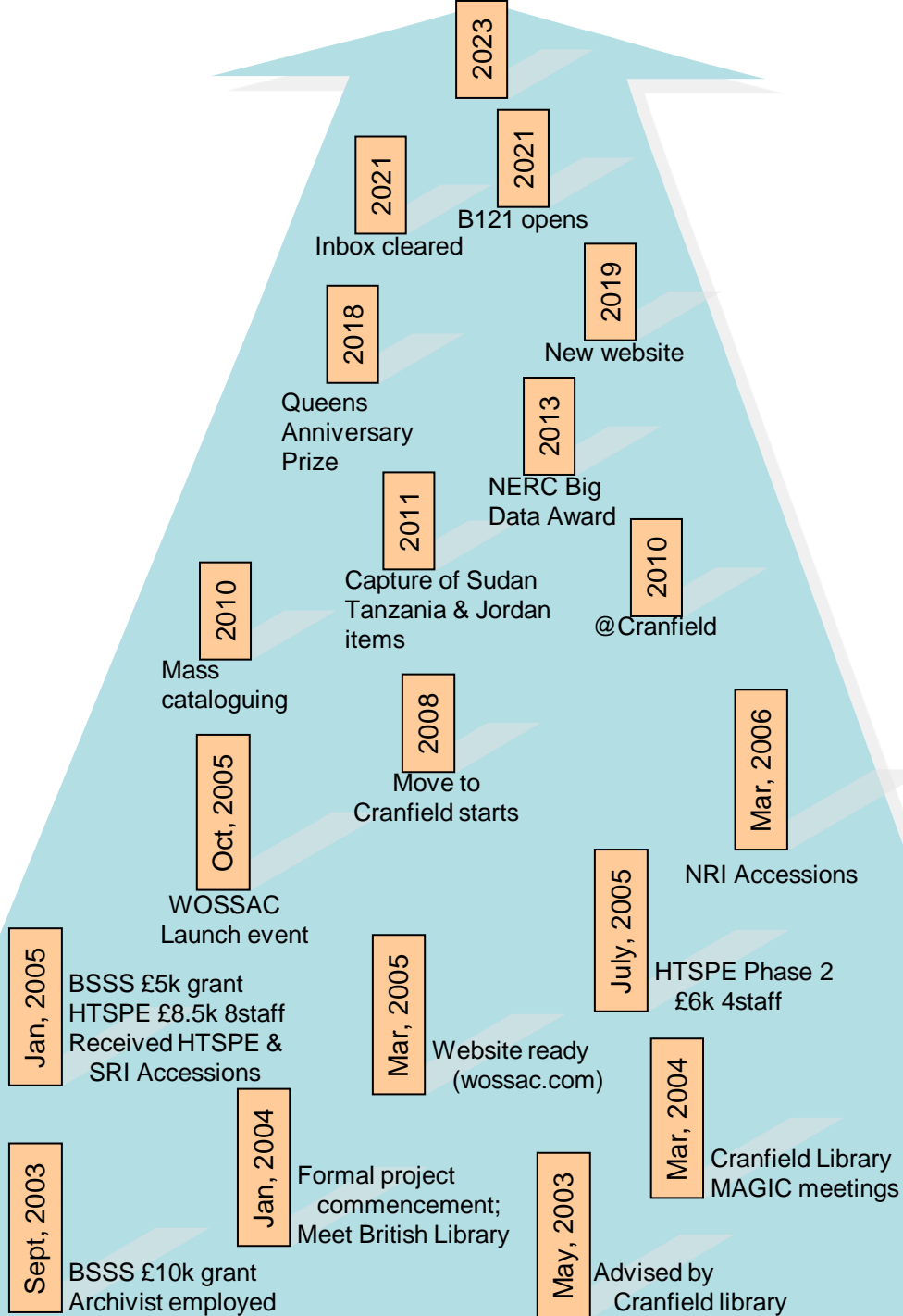
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Queens Anniversary Award - 2018



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2015 & 2017

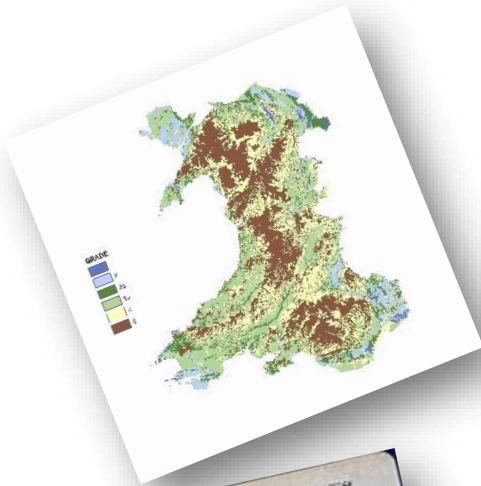
See <http://www.wossac.com/blog.cfm>



The Future ...

1. • Secure this precious collection of maps, reports and digital media
 - Corresponding with other UK sources
2. • Develop the growing research base of WOSSAC users
 - Doctoral and Masters students world-wide, re-patriate data
3. • Undertake research to improve remote access and application of collection
 - Scanning and PDF impressions of holdings, OCR text, web services...
4. • Develop links to the 5 major holders of similar information, forming a global archive of soils information: ISRIC, IRD, ESB, FAO, USDA

The issue as ever is securing funding support for these activities



Soil Survey of the Great Britain and Ireland

Area	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000
Area	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000
Area	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000
Area	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000
Area	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000
Area	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000
Area	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000
Area	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000
Area	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000
Area	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000

A Soil Map of Great Britain
 F. M. BRIDGES

A volume in the series of the Soil Survey of Great Britain and Ireland, published by the Ministry of Agriculture and Fisheries, London, 1911.

The map shows the distribution of soil types across Great Britain, with a legend and a scale. The legend includes categories such as 1. Brown soils, 2. Yellow soils, 3. Brown soils, 4. Brown soils, 5. Brown soils, 6. Brown soils, 7. Brown soils, 8. Brown soils, 9. Brown soils, 10. Brown soils, 11. Brown soils, 12. Brown soils, 13. Brown soils, 14. Brown soils, 15. Brown soils, 16. Brown soils, 17. Brown soils, 18. Brown soils, 19. Brown soils, 20. Brown soils.

