



BRITISH  
SOCIETY  
OF SOIL  
SCIENCE

# soilmatters

VOLUME 2 - ISSUE 1 | JUNE 2022 | THE MAGAZINE OF THE BRITISH SOCIETY OF SOIL SCIENCE

# SOIL

## Highlighting the importance of soil

WORLD CONGRESS OF SOIL SCIENCE AND THE  
UN SUSTAINABLE DEVELOPMENT GOALS

PAGE 18



### 75TH ANNIVERSARY YEAR

2022 marks the 75th anniversary of the British Society of Soil Science

### WCSS 2022

Join us at the SEC in Glasgow from 31 July to 5 August

### ZOOM INTO SOIL

Overviews from our first four webinars of 2022

### CORPORATE MEMBERSHIP

Cranfield University and Kabloom have joined the Society!



## KEYNOTE SPEAKERS



**Prof Ismahane Elouafi**

Chief Scientist, UN FAO



**Dr Debra Roberts**

Co-Chair of Working Group II of the IPCC, Durban, South Africa



**Dr Ranveer Chandra**

CTO Agri-Food, Microsoft, USA



**Prof Suzi Huff Theodoro**

Professor of Soil Geology, Pesquisadora Universidade de Brasilia

Visit [www.22wcsc.org](http://www.22wcsc.org) for more information

#WCSS22



## Crossing Borders, Changing Societies

Significant issues continue to affect our natural environment, with many of these affecting soil: erosion, loss of soil carbon and biodiversity, soil compaction and sealing and impacts on food security. The World Congress of Soil Science 2022, *Crossing Boundaries - Changing Society*, aims to address these issues amongst others, with a wide range of Plenary, Divisional and Interdivisional sessions planned. These will focus on soils and security, the north/south divide, soils and land use in the 22nd Century and data and information and will encourage academics and practitioners from varying disciplines to work together and achieve greater success and understanding.

### Bruce Lascelles,

BSSS President 2021 - 2022

Chair Congress Organising Committee

## HIGHLIGHTS

Scientific Programme

Policy Programme

Virtual and In-person Pico Presentations

Hybrid Elements

Exhibition

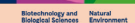
Soil Tours

Arts Programme

Well-being Activities

Social Programme

### GOLD SPONSORS





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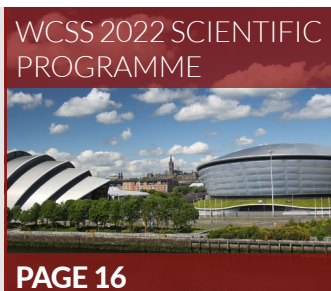
**NEW MEMBERS' AREA**



**PAGE 7**

Find out more about our new members'-only section to the website.

**WCSS 2022 SCIENTIFIC PROGRAMME**



**PAGE 16**

Including the plenary, divisional and interdivisional sessions, keynote and oral presenters.

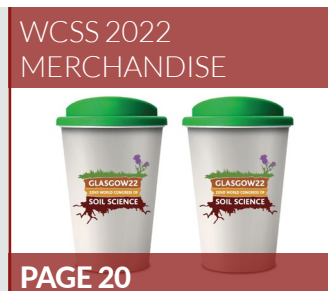
**WCSS 2022 POLICY PROGRAMME**



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The first session of its kind at the World Congress of Soil Science.

**WCSS 2022 MERCHANDISE**



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Take home a piece of WCSS 2022 with our exclusive, sustainably-sourced merchandise.

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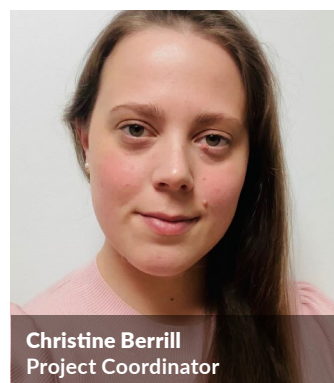
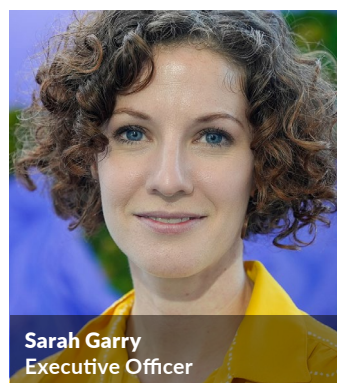
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*Promoting the study and profession of soil science*

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## Editorial team



## Contact us

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### Cover:

Stills from the videos created to highlight the importance of soil in achieving the UN Sustainable Development Goals.

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# President's Welcome

**2022 is the Society's 75th anniversary year and earlier this year and for the first time, our Board set out its 10-year strategic vision. This vision supports our Mission Statement, which is unchanged, and guides our short-term deliverables against our long-term objectives; facilitating outcomes which benefit both our members, and our wider stakeholders.**

With a small team in place, this plan will allow Sarah to work with our staff and volunteers and ensure we are maximising the resources we have and allowing everyone to work towards the same long-term goals.

Our 10-year strategy sets out what our Board sees the Society achieving by the end of the years 2022, 2025 and 2030. Our Council has set out a clear way to measure our progress against this vision and will be monitoring our progress both against the delivery of an annual strategy and key performance indicators (KPIs).

This move will provide us with a way to accurately assess how well the Society is delivering its overall vision and allow us to clearly demonstrate our impact. Although we have begun measuring our impact as can be seen in this year's Annual Report (page 12), our new measurement process will allow our Board and Council to see what is working well and what needs to be improved. Measuring this detail will provide us with the tools we need to ring the changes and if necessary, review our 10-year vision to make sure our direction of travel still meets the Society's needs.

Council and Board will review our 2022 strategy and KPIs in early 2023 and the results will feature in next year's Annual Report.

As always, we would be delighted to hear your thoughts on our vision and please do take the time to feed your thoughts back to myself or Sarah.

[www.soils.org.uk/about-us/governance/society-strategy-and-10-year-vision](http://www.soils.org.uk/about-us/governance/society-strategy-and-10-year-vision)

## World Congress of Soil Science

As many of you know, I have been heavily involved with the World Congress of Soil Science since we first bid to host the event almost ten years ago. And what better way to celebrate our 75th anniversary than by hosting the international soil science event.

It feels very strange to be writing this with only a month to go until the Congress begins. This issue of Soil Matters contains everything you need ahead of the event, from details of the programme, to other activities and meetings that will be taking place during the event.

We expect over 2,000 people to attend the event in person and with at least 500 to attend online. We hope that you will be able to take advantage of the fantastic scientific programme and social and arts activities we have planned. Whether you are interested in arts and culture, and will be attending the exhibition *We are Compost / Composting the We* at the Centre for Contemporary Arts in Glasgow (page 22), you have a passion for education and plan to bring your children to meet our team at the Glasgow Science Centre (page 24) or would like to join your colleagues for a fun run along the Clyde, there will be something for everyone during the Congress.

The scientific and policy programmes will feature a wealth of international expertise from researchers, practitioners, policy makers and campaigners, with some very special guests due to attend our Opening and Closing ceremonies. For those of you who haven't already, there is still time to register to attend the event in Glasgow and see our fantastic speakers in person or online. [www.22wcss.org](http://www.22wcss.org).

I would like to close by thanking our volunteers, and particularly those involved in the World Congress Working Group, the tours leads and those who will be volunteering during the Congress.

Thank you.

It is only with your support that we have been able to develop the Congress into the fantastic event it is sure to be.

I look forward to welcoming you to Glasgow

**Dr Bruce Lascelles**  
President 2021 - 2022



*"Council and Board will review our 2022 strategy and KPIs in early 2023 and the results will feature in next year's Annual Report."*



# Executive Officer's Welcome

*"Not content with hosting the World Congress this year, we will also be participating at Contamination and Geotech Expo from 14 – 15 September at the NEC, Birmingham and the Science Council Conference on 29 September in London."*



Welcome to the first edition of Soil Matters in this, our 75th anniversary year.

**As Bruce has already stated, this issue largely focuses on the World Congress: the pinnacle of our 75th year and perhaps of our history as a Society.**

Understandably many of our activities this year have been linked to the delivery of the Congress, including delivering two of our Zoom into Soil lunchtime webinars on Scottish soils (page 14). These sessions secured fantastic feedback with 95% attending, learning something new. Although we are taking a break from our Zoom into Soil sessions over the summer to allow us to focus our efforts on the World Congress, we will be back in the autumn with sessions on fertilisers and soil remediation.

In the lead up to the Congress, we have been drawing attention to the importance of soils amongst a wider network. Our latest series of four videos have been designed to demonstrate the importance of soil in achieving the UN Sustainable Development Goals. The videos: Life on Land, Clean Water and Sanitation, Sustainable Cities and Food and Farming, set out in less than a minute each why soil is essential in securing humanity's future. Thank you to members Jane Rickson and Bob Evans for supporting the video development and to the amazing contributors from a wealth of disciplines and organisations.

Please do share these with your networks, they are a fantastic way to highlight soils' importance, particularly to those with no prior knowledge of the subject.

We have been delighted that this is the year that we have finally been able to **meet up again in person** and we are delighted to have reports from our South East (page 29) and Midlands Regional Groups (page 28), which held their first face-to-face events for three years this spring.

Our AGM will also be our first in person general meeting for three years. Taking place on **Tuesday 2 August** from **11am to 12 noon** during the Congress, we will be celebrating our birthday with elevenses: a cup

of tea and a slice of birthday cake. Join us to recap our successes over the past 75 years, and network with your current and future colleagues. Having started in May 2020, this will be one of my first opportunities to meet members together and I am looking forward to finding out your views on the Society.

Papers have now been distributed for the AGM and please take the opportunity to review them and have your say in our online ballot (page 12). Following the update of our Bye Laws last year, we are now able to give all members the opportunity to have their say in advance of the AGM. Once you have voted on the resolutions online, we will announce the outcomes at the AGM, reducing the need for formalities on the day and providing us with more time to meet and chat as we haven't for a long time!

We will also host an in-person event for Early Career professionals during the Congress. Members and non-member early career professionals are welcome at the session on **Monday 1 August** from **1:15 to 2:45pm** where we will be hosting a variety of fun activities, including a game of networking bingo!

Not content with hosting the World Congress this year, we will also be participating at Contamination and Geotech Expo from 14 – 15 September at the NEC, Birmingham and the Science Council Conference on Climate Change on 29 September in London. Both events provide a fantastic opportunity to continue raising the profile of the Society and ensure our increased visibility is not lost after the Congress is delivered.

We look forward to welcoming you to Glasgow.

**Sarah Garry**  
Executive Officer



# Response to Construction Code of Practice

The Society responded to the *Construction Code of Practice for Sustainable Use of Soils on Construction Sites* consultation being undertaken by CL:AIRE on behalf of Defra. The Society's response focused on the importance of the code but highlighted the need for a future version to:



Department  
for Environment  
Food & Rural Affairs

- highlight where it should be considered in conjunction with other documentation and disciplines (such as British Standards (BS) for sampling methodology or Design Manual for Roads and Bridges (DMRB) guidance for soil impact assessments)
- expand the number of case studies from the existing residential developments
- recognise competing priorities between organisations working with soil: environmental impact could be more important than the works cost to some, with the reverse also often true
- provide basic guidance on making soil suitable for its intended end use
- provide more guidance on ameliorating and reusing soil, to avoid soil being disposed of as waste.

## #PeatFreeApril

SAY NO TO COMPOST FROM PEATLANDS

### Joint Statement on Peat

Alongside other major UK organisations, we signed a joint statement to support the ban of peat in the retail sector for horticulture before the current 2024 deadline.

The statement reads, "Every year, millions of cubic metres of peat are dug out of the ground to be sold in UK markets for horticulture...Protecting peatlands is a vital step we must take to put nature into recovery...". It highlights the urgent issue for the UK Government to act decisively on.

Please visit the Peat Free website to read the full statement: [www.peatfree.org.uk/2022/03/joint-statement](http://www.peatfree.org.uk/2022/03/joint-statement).

## Call for National Advocate for Soil Health

In February and June, the Society wrote to the Rt Hon George Eustice, Secretary of State for Environment, Food and Rural Affairs, calling for a National Advocate for Soil Health to be introduced in the UK. The letter suggested that the UK follow the Australian government's lead.

The proposed role would be to:

- actively advocate across Government departments and externally, for soil health
- work with researchers to ensure soils research met the needs of the UK's farmers and other soil managers
- advocate for adequate knowledge and supporting systems to help farmers actively build healthy soils.

[www.soils.org.uk/news/call-for-national-advocate-for-soil-health](http://www.soils.org.uk/news/call-for-national-advocate-for-soil-health)

## President Speaks

Our President, Dr Bruce Lascelles, presented at the Ecological Continuity Trust's webinar in March. *Engaging More Soil Scientists in Long-term Ecological Experiments* introduced the Society to viewers, raising awareness of our scientific journals, Science Note: Soil Carbon and the Working With Soil programme. Bruce highlighted the importance of soil and the soil life nexus concept, as well as discussing habitat translocation, soil strategies and Environmental Impact Assessments. He concluded that there is great value and justification for soil scientists and ecologists to work together with more scope for collaboration.



If you missed the webinar, it is available to view on ECT's YouTube channel and is well worth the watch!

[www.youtube.com/watch?v=G9FVeMP2YEQ](https://www.youtube.com/watch?v=G9FVeMP2YEQ)

## Agricultural Land Classification Course: Save the Date!

Agricultural Land Classification (ALC) has a formal role in the planning system in England and Wales and is designed to prevent the loss of our best and most versatile land in line with the principles of sustainable development.

The training course, designed and presented by agricultural land classification (ALC) experts from Natural England and the Welsh Government, offers a unique opportunity to learn about the background and technical basis of the current ALC guidelines.

By the end of the course, you will learn:

- about how the ALC system has developed over time, its underlying principles and its role within the planning system - the WHAT, WHY and WHEN of ALC
- all the details of how land is graded - the HOW of ALC
- what a report should contain to be verified by the Natural England

and Welsh Government statutory consultees on planning applications involving soils and agriculture.

The course will include the opportunity to work within a group to undertake an ALC grading desk exercise to apply what you have learned.

This course is designed for:

- soil scientists who wish to extend their experience to (or refresh an existing

awareness of) Agricultural Land Classification

- those commissioning ALC surveys from specialists, and
- planners reviewing ALC reports.

The virtual course will consist of three consecutive half-day sessions (Tuesday 22 to Thursday 24 November) and a further question and answer session two weeks later (Tuesday 6 December).

Book online via [www.britishsocietyofsoilscience.wildapricot.org/event-4836014](http://www.britishsocietyofsoilscience.wildapricot.org/event-4836014)



# 75th Anniversary

2022 marks the 75th anniversary of the British Society of Soil Science (BSSS); our first meeting taking place on 15 April, and first Council meeting on 4 June 1947. Designed especially for this celebratory year, our new logo has been in use, appearing on our website and communications.

During our 75-year history, we have led the way in distributing soil research to members, stakeholders and researchers, particularly via our two journals the European Journal of Soil Science (formerly Journal of Soil Science, first published in 1950) and Soil Use and Management (first published in 1985) and our conferences and events.

Join us at the Society's 76th AGM on 2 August, taking place from 11:00am to 12:00 noon during the World Congress of Soil Science in Glasgow, where we will be celebrating 75 fantastic years of BSSS with cake and coffee, and raising a toast to many more!

**75**  
YEARS 1947-2022



**BRITISH SOCIETY  
OF SOIL SCIENCE**

## Launch of Members' Area

Have you visited the new Members' Area of our website yet?

We have introduced a members-only section to the website for convenient access to all the fantastic benefits Society membership has to offer. Make the most of the handy portal and check out:

- **Discounts and Benefits** – additional benefits that add value to your membership through our Corporate Partners and other key relationships
- **Resources** – leaflets generated from our recent workshops
- **E-newsletters** – previous issues of our twice-monthly members' e-newsletters, Ear to the Ground
- **Early Career E-newsletters** - previous issues of the recently launch bi-monthly Early Career e-newsletters, Eye to the Horizon
- **Videos** – keynote presentations and workshops from our member-only conferences and events
- **Media Toolkit** – resources to let everyone know that you are a member of the Society.



Visit the portal now to find out more:

[www.soils.org.uk/members-area](http://www.soils.org.uk/members-area)

## New Membership Benefits

### HOSPITAL AND MEDICAL CARE ASSOCIATION (HMCA)



We have agreed with HMCA to offer discounted rates for medical plans, dental plan, hospital cash plans, travel plan, income protection and vehicle breakdown products.

HMCA only offer medical plans to membership groups and can offer up to a 40% discount off the underwriter's standard rates. This is a comprehensive plan which provides generous cash benefits for surgery and other charges.

**Who are HMCA?** – HMCA has specialised in providing benefits and services to associations and professional groups since the 1970s. HMCA is authorised and regulated by the Financial Conduct Authority.

For further information and quotations, contact HMCA by telephone on **01423 799949** or visit the exclusive HMCA British Society of Soil Science website here: [www.hmca.co.uk/bsss](http://www.hmca.co.uk/bsss)

## Absolute. ABSOLUTE INSURANCE BROKERS

Absolute Insurance Brokers is a specialist commercial insurance broker with experience in the placement of Professional Indemnity and Contractors package insurance.

With existing clients operating in the soil sampling and geo drilling sectors, including more diverse areas such as piling, Absolute Insurance Brokers is delighted to be able to assist members in advising on their corporate and commercial insurance needs.

The British Society of Soil Science also broke with Absolute Insurance Brokers and receive a small introducers' fee for every member who takes out a policy.

If you would like to discuss your requirements or even just get an alternative view on your current arrangements, please call Andrew Dix on **0208 915 1022** who will be happy to assist.

# Zoom into Soil: Regenerative Agriculture

On Wednesday 12 January 2022, we hosted our first Zoom into Soil webinar of the year, focussing on regenerative agriculture. Supported by ADAS in collaboration with the British Ecological Society (BES), proceedings were opened by Daniela Russi, Senior Policy Manager at BES, who summarised the wide extent of the work that BES undertakes, supporting ecologists at all career stages and producing eight journals. John Williams, Head of the Soils and Nutrient Group at ADAS, followed this by summarising the research and advisory work that ADAS undertakes across the UK covering all aspects of soil, land, and agricultural management.

To provide the webinar content, we were delighted to welcome Dr Anne Bhogal, a Senior Soil Scientist at ADAS, who presented *Soil organic matter: the key to regenerative agriculture* and Professor Richard Bardgett, Professor of Ecology at the University of Manchester, who presented *Biodiversity is Key to Regenerative Agriculture: A Below-ground Perspective*.

## Regenerative Agriculture

Dr Bhogal and Prof Bardgett began their talks outlining the widespread interest and reporting of the term Regenerative Agriculture in the press in recent years. Even though the term has not been used widely in academic literature thus far, it has become increasingly prominent amongst policy makers and practitioners. There seem to be many definitions of the term used, which are dependent on the context and the desirable outcomes of the agricultural system. Both speakers agreed that the premise of regenerative agriculture principals is to go beyond just sustaining the environment, but to restore and enhance ecosystem services. As a result, soil management is generally a key focus of the regenerative agricultural practices that are widely used.

Both speakers summarised what are generally considered to be important practices associated with regenerative agriculture: minimising or avoiding soil disturbance; maintenance of soil cover; maintenance of living roots; fostering plant and soil diversity; enhancing water percolation; and integrating on-farm livestock/cropping operations.

## Soil Organic Matter

The majority of soil functions are underpinned by the biological decomposition of Soil Organic Matter (SOM). Dr Bhogal explained that SOM influences many soil functions and could be described as the major currency in all soil systems. As such, it is widely considered to be an appropriate indicator of soil health.

Building SOM can help to improve the soils aggregate stability, water retention and infiltration, cation exchange capacity, and improve biological activity by providing a food and habitat source. In agronomic terms, this translates into improved nutrient and water capture for crops, as well as reductions in pollution events. These points can combine to create agricultural systems with improved

consistency of production and greater resilience to challenging conditions, and ultimately reduced crop production costs for farmers.

So, how do we know if our soils are degraded? And what is a good level of organic matter in a soil? Dr Bhogal discussed how many researchers have tried to answer these key questions over the years and have concluded that there is not an easily defined SOM 'critical level' at which soil functions become impaired. This is because the SOM content is heavily influenced by the soils clay content and total precipitation of the region. Therefore, soils can be benchmarked against a range of typical values from soils with similar precipitation rate and clay content to get an understanding of how the SOM level compares to a benchmark.

In soils where management practices have not changed in a significant time period, the SOM level will have reached an equilibrium, where the inputs of organic matter are equal to the total output. However, when the soil management is altered, either by increasing organic input to the soil or by slowing the decomposition process, do we begin to see changes to the total SOM? Initially the rate of these changes is rapid, which gradually slows as the soil approaches the new equilibrium. Dr Bhogal commented that the ability of the soil to build organic matter is a finite process, with the initial rapid accumulation not typically being sustained over time. She also emphasised that any positive changes are also rapidly reversed with negative alterations to the soil management.

## Fostering plant and soil diversity

Prof Bardgett focused his talk on how we can foster biodiversity for regenerative agriculture. He emphasised the importance of soil biodiversity as an integral part of ecosystem functioning. He outlined how land use can alter the resilience of the soil food webs, with extensive agricultural systems having more complex versions.

Prof Bardgett gave an overview of how systems with increased plant biodiversity are associated with multiple benefits to the soil, which can include improved aggregate stability, soil biodiversity, and carbon sequestration. He presented some strong evidence in the form of a meta-analysis, concluding that agricultural diversification promoted multiple

ecosystem services without compromising crop yield. However, he noted that the effects of crop diversity are strongly context-dependant, and as such more research needs to be aimed at understanding this in different agricultural systems and crops.

Dr Bhogal summarised some of the known benefits of inclusion of grass leys and cover crops in arable rotations. Keeping the soil covered with a growing crop during the winter months can have a variety of benefits for reducing nitrogen leaching and soil erosion during that period. She presented some AHDB research which showed that growth of cover crops mixes had some soil structural improvement in comparison to winter fallow.

## Grazing Animals

Addition of grass leys into arable rotations can be of great benefit to the soil, mainly due to longer term ground cover, the reduction in tillage, and the litter/manure return to the soil. Dr Bhogal presented data from several trials which showed evidence that land use change from grassland to arable resulted in a reduction in soil carbon stocks.

Both speakers discussed the role of grazing animals in maintaining grassland soils. Grassland soils in the UK have a large carbon stock and generally have a wide range of soil biodiversity. Management of grazing animals can influence many of the soils biological processes as it can alter the microbial community structure in the soil. This can have important changes to nutrient cycling of the grassland soils and the overall productivity of the system.

Currently, one main topic of debate amongst livestock farmers and researchers is stocking density of grazing animals. Prof Bardgett presented a study in which different stocking densities (Extensive, Intermediate, and Intensive) were monitored for their effects on soil carbon. It was found that the highest carbon stocks are generally found at an intermediate level of grazing. He also presented evidence to suggest that the diversity of the grazing livestock may have an effect on multi-diversity (plant and soil organisms) and multifunctionality of soil functions.

Prof Bardgett showed evidence suggesting that when grazing is removed from grassland management, there is sometimes found to be a loss of above and below ground biodiversity, as well as a drop in carbon stocks in some cases. He summarised his fascinating talk by commenting that the effects of grazers on carbon storage seem to be heavily context dependant. Thus, the optimum level of grazing in grassland systems for soil health improvement is variable.

**The full webinar is available to view via the BSSS YouTube channel; [www.youtube.com/user/BritishSocietyofSoil](https://www.youtube.com/user/BritishSocietyofSoil)**



# Zoom into Soil:

## A Successful Garden Above and Below Ground

On Wednesday 2 March, we hosted our third webinar of the year, *Zoom into Soil: A Successful Garden Above and Below Ground* in collaboration with the Ecological Continuity Trust (ECT).

### Building a Garden: From the Ground Up, and Back to Earth Again

By The Handsome Gardener (Jon Dickinson)

Jon Dickinson is better known as The Handsome Gardener, an Instagram sensation who is passionate about creating beautiful, biodiverse gardens and promoting the message of the importance of gardening management and how it can benefit the environment.

Jon's presentation focused on how he had developed his garden over time, reducing the lawn area with a thick mulch and cardboard layer to kill off the grass and create an organic rich layer for planting his favourite plants, herbaceous perennials. Jon took inspiration for his garden design from local gardens and recommended that anyone interested in doing something similar should visit local RHS gardens, botanic gardens, and national trust properties to pick up ideas and tips. He urged that when you go, make sure you speak to as many people as possible who are similarly passionate about gardening... and don't forget to take some photos to remind yourself!

Jon's key tip during the planning stage was to measure the area of your garden before beginning any work, particularly if your ideas have come from large gardens with acres of space. He also stressed the importance of researching your chosen plants to understand how much space they need to grow.

Jon's next tip was to take a closer look at the soil, digging to assess the soil type and see if you need to remove any rubble or rubbish that is commonly found in garden soils. He spoke about the importance of adding organic matter to the soil, and that in most cases it is better to add this to an

undisturbed soil surface and allow the soil biology to break it down without digging it in. He commented that high fertility soils are not always the best thing for the plants in your garden and it should be dictated by the plant diversity that you are growing. For example, Jon's herbaceous perennials respond well to high-nutrient addition, however in some cases, such as growing Mediterranean plants, there may be a need to reduce the soil fertility by adding sand to the soil.

As an amateur gardener, Jon gave a beginner's perspective; from believing soil was the "brown stuff his plants grew in" to now understanding and appreciating the many ecosystem services that soils provide. Growing herbaceous plants means that his plants have deeper roots systems, and the high organic matter mulch that he covers the soil surface with helps to retain moisture in the soil, significantly reducing the amount of watering needed. He also believes there is less weed pressure from growing perennial plants in a dense planting plan with the aid of regular mulching, as the perennials out compete weeds for light, water, and nutrients.

### Fostering Mycorrhizal Fungi For a Naturally Healthy Garden

By Jill Kowal, Researcher at The Royal Botanic Gardens, Kew



The aim of Dr Jill Kowal's presentation was to provide the viewer with an x-ray view of mycorrhizal fungi in soils and give practical knowledge about how to use this information in their gardens and fields.

Mycorrhizal fungi are fungi (myco) that form a mutualistic relationship with plant roots (rhiza); an ecological reaction between two species where both receive a benefit. Mycorrhizas grow in association with plant roots and exist by utilising sugars from the host plant. The fungi then help the plant to assimilate moisture and nutrients from the soil as the mycorrhizas fungal strands greatly increase the absorptive area of a plant, extending the root system.

Jill spoke about the evolution of the fungus-plant mutualism, presenting a land plant phylogeny showing the lineage of the land plants and the associated mycorrhizal fungal guilds. Across the fungal guilds, there are many types of fungi which associate with many different plant types. The modern garden plants (Angiosperms and Gymnosperms) associate with all four guilds

that trace back to the early Bryophytes.

There are two main colonization strategies of mycorrhizal fungi: ectomycorrhizal fungi and endomycorrhizal fungi. Ectomycorrhizal fungi, external fungal colonisers, can be characterised by producing fruiting bodies on the soil surface and by the formation of a dense hyphal sheath, known as the mantle which surrounds the root surface. They form on the roots of around 2% of plant species, usually woody plants, including many species of temperate and boreal forest tree. Endomycorrhizal fungi can be characterised by internal penetration of the root cells, where the interface or nutrients occur. They do not produce fruiting bodies, and form associations with 80-90% of the plant species on earth across all habitats and climate zones.

Jill outlined the functions of the mycorrhizal fungi, assisting the plant with the macro and micronutrient acquisition and water uptake. They provide a valuable stress buffer to the plant and aid its reaction to toxins in the soil, drought, and flooding. The large and extensive biomass of mycorrhizal fungi is an effective soil stabiliser and plays a key role in carbon sequestration in soil. They are also known to form communication networks within fungal and plant communities.

Jill presented some of her own research where she ran an experiment to test the efficacy of using one mycorrhizal fungus from one plant to fertilise another plant. She used Heather and Liverwort, which form the same mycorrhizal association, isolating the fungi from the wild liverwort and transferring this back into glasshouse grown liverworts. These were then taken and applied to heather cuttings. She found that the cuttings treated with the fungus or the colonised liverworts had a significantly better survival rate compared to the control, confirming that this could be used as a viable stress-regulator for flooding.

Jill finished by explaining how this knowledge can be used in the garden. She detailed the efficacy of mycorrhizal inoculant products which are frequently sold to gardeners for improved establishment of their plants. She concluded that in some cases, the products have limited efficacy depending on the plants being grown and it is therefore important to understand the plants being grown in your garden and identify if inoculation will be effective, and by what product.

**The full webinar is available to view free of charge via the BSSS YouTube channel; [www.youtube.com/user/BritishSocietyofSoil](http://www.youtube.com/user/BritishSocietyofSoil)**



# Career Interview

Name: **Dr Patricia Bruneau** Job Title: **Soil Science Advisor** Organisation: **NatureScot** (formally known as Scottish Natural Heritage)



## A day in the life of...

Most of my work time is spent dealing with a range of soil use and management issues concerning nature conservation policy and activities in Scotland.

Rising early, I typically start my day dealing with queries about soils that have arisen from colleagues at Nature Scot, other Scottish government agencies and the general public. I then work on more long-term projects including formal responses to statutory consultations, engaging with other government agencies on developing policy, and research activities to support all of Scotland's Nature.

This means that a lot of my time I am 'networking' to ensure that we all talk more about soils and make access to information about soil relevant to all our work.

## How does your job fit within Soil Science?

My work is all about soils, but not only about soils. It embraces wider environmental topics like habitat management, planning and pollution control. This makes my work exciting, but also sometimes challenging.

## Why is this an interesting area to work in?

The multidisciplinary of soil science, coupled with the multiple topics that my job requires me to consider, provides a constant source of intellectual stimulus. It is also very satisfying to have witnessed how soils have become more relevant to many aspects of our life and their roles and values have become more widely acknowledged.

## Why Soil Science?

My interest with nature started with geology, and has always been with what lies below our feet. In my post graduate studies, I started to consider surface processes and then become interested in soils when one of my friends started a PhD in soil science and got me hooked on studying soils too!

It turns out that the skills I have developed reading earth sciences were in demand for modelling soil processes. I chose to do a

masters in soil science rather than continuing studying applied geophysics with no regrets.

## What did you study?

My whole education was in France. I read applied and fundamental geology and geophysics at undergraduate and post-graduate level at the University of Rennes. I did a research-led masters (DEA) on soil science at Pierre and Marie Curie University, now Sorbonne-Paris University. This was the first year of new national post-grad programmes, and turned out to be a great opportunity to learn first-hand from the 'crème de la crème' of French researchers and academics on broad aspects of soil science. I followed this with a PhD in soil science at the same university, co-funded by INRA, the French National Institute for Agricultural Research, looking at modelling diffuse pollution in a small agricultural catchment, considering field level land use and input loads.

## What has your career path been so far? / How did you begin your career?

After finishing my PhD in France, I moved to Britain to work at Silsoe Research Institute, then a major BBSRC institute. I joined their overseas division working in developing water and soil models in Zimbabwe and Tanzania. At the end of this, I moved to more fundamental research in soil physics, principally at study locations in the UK, investigating the dynamics of surface soil properties and agricultural management practices.

I added another strand to my professional experience joining the NERC Thematic Programme *Biological Diversity and Ecosystem function in Soil* with the University of Stirling to examine soil biodiversity in soil microstructure and morphology.

After nearly 10 years of post doc work and not keen on teaching, I decided to move into a different line of work and joined Scottish Natural Heritage (now NatureScot) as a 'soil science' policy advisor.

## What is the best thing about your job?

My job has a great mix of dealing with fundamental policy issues, management of research, and outreach to colleagues and the public. My colleagues in NatureScot are

hugely supportive and great to work with. Also, occasionally, I am able to go in the field for real soil science work!

## What skills, abilities and personal attributes are essential to success in your job/this field?

Understanding how government and its agencies work and being able to address their need for evidence is key to my role. Being able to bridge between policy and research has required me to use my knowledge of scientific approaches, have an attention to policy detail, and understand the boundary between networking and lobbying. Sometimes I have to be very assertive!

## What advice would you offer to young people interested in a career in soil science?

Go for it! Try to get a broad foundation in your degree. Learn about good science principles and the critical evaluation. These transferable skills will serve you well during your career.

## Can you recommend other journals, magazines or professional associations which would be helpful for professional development?

Don't just read about soils but broaden your horizons. This could help understand what others need to know about soils.

## If you could do it all over again, would you choose the same path for yourself? If not, what would you change?

Yes absolutely!

## Tell us one thing about yourself that not many people know

I enjoy sailing the west coast of Scotland on our boat *Té Bheag nan Eilean* and I am a keen bridge player.

## Is there anything else that you would like to share relating to your work in soil science?

I did a term on BSSS council and would recommend that experience to all.



# In Case You Missed It

## Understanding the joint impacts of soil architecture and microbial dynamics on soil functions: Insights derived from microscale models

Over the last decades, a new generation of microscale models have been developed to simulate soil microbial activity. First published in May 2022, Pot *et al.* summarize the main results obtained by these models according to six model outputs: growth and spatial organization of microbial colonies, soil hydraulic conductivity, coexistence and trophic interactions of microorganisms, temporal dynamics of the amount of solid and dissolved organic matter in soil, and microbial production of CO<sub>2</sub>. For each of these outputs, the authors draw particular attention to the respective roles of soil architecture and microbial dynamics, and report how microscale models allow for disentangling and quantifying them. Finally, they discuss limitations and future directions of microscale models in combination with the on-going development of high-performance imaging tools revealing the spatial heterogeneity of the actors of soil microbial activity.

<https://doi.org/10.1111/ejss.13256>

## Soil carbon sequestration for climate change mitigation: Mineralization kinetics of organic inputs as an overlooked limitation

Over the last few years, the question of whether soil carbon sequestration could contribute significantly to climate change mitigation has been the object of numerous debates. All of these debates so far appear to have entirely overlooked a crucial aspect of the question. It concerns the short-term mineralization kinetics of fresh organic matter added to soils, which is occasionally alluded to in the literature, but is almost always subsumed in a broader modelling context. Published in EJSS 73:1, Berthelin *et al.* summarise what is currently known about the kinetics of mineralization of plant residues added to soils, and about its modelling in the long run. The authors then argue that in the short run, this microbially-mediated process has important practical consequences that cannot be ignored.

<https://doi.org/10.1111/ejss.13221>

## A comparison of peat properties in intact, afforested and restored raised and blanket bogs

Recognition of peatlands as a key natural store of terrestrial carbon has led to new initiatives to protect and restore them. Some afforested bogs are being clear-felled and restored (forest-to-bog restoration) to recover pre-afforestation ecosystem function. However, little is known about differences in the peat properties between intact, afforested and restored bogs. In their research paper, Howson *et al.* used a stratified random sampling procedure to take 122 peat cores from three separate microforms associated with intact (hollows; hummocks; lawns), afforested and restored bogs (furrows; original surface; ridges) at two raised and two blanket bog locations in Scotland. While significant differences were found between treatments, effect sizes were mainly small, and greater differences in pH, electrical conductivity, specific yield, and hydraulic conductivity existed between the different intact bogs. Therefore, interactions between geographic location and land management need to be considered when interpreting the impacts of land-use change on peatland properties and functioning.

<https://doi.org/10.1111/sum.12826>

## Optimizing fen peatland water-table depth for romaine lettuce growth to reduce peat wastage under future climate warming

Forty percentage of UK peatlands have been drained for agricultural use, which has caused serious peat wastage and associated greenhouse gas emissions (carbon dioxide (CO<sub>2</sub>) and methane (CH<sub>4</sub>)). Published in SUM 38:1, Matysek *et al.* evaluated potential trade-offs between water-table management practices for minimizing peat wastage and greenhouse gas emissions, while seeking to sustain romaine lettuce production: one of the most economically relevant crop in the East Anglian Fenlands. In a controlled environment experiment, the authors measured lettuce yield, CO<sub>2</sub>, CH<sub>4</sub> fluxes and dissolved organic carbon (DOC) released from an agricultural fen soil at two temperatures (ambient and +2°C) and three water-table levels (-30 cm, -40 cm and -50 cm below the surface). They showed that increasing the water table from the currently used field level of -50 cm to

-40 cm and -30 cm reduced CO<sub>2</sub> emissions, did not affect CH<sub>4</sub> fluxes, but significantly reduced yield and increased DOC leaching. Warming of 2°C increased both lettuce yield (fresh leaf biomass) and peat decomposition through the loss of carbon as CO<sub>2</sub> and DOC. However, there was no difference in the dry leaf biomass between the intermediate (-40 cm) and the low (-50 cm) water table, suggesting that romaine lettuce grown at this higher water level should have similar energetic value as the crop cultivated at -50 cm, representing a possible compromise to decrease peat oxidation and maintain agricultural production.

<https://doi.org/10.1111/sum.12729>

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## Wiley Event

### Find a Home For Your Next Paper!

Wiley, together with BSSS Editors Professor Jenni Dungait (Editor-in-Chief, *European Journal of Soil Science*) and Dr. David O'Connor (Deputy Editor, *Soil Use and Management*) are holding an information and networking event aimed at helping Early Career Scientists navigate the Open Access ecosystem and ultimately to get published as painlessly as possible. Covering all topics in Open Research and highlighting tools aimed at simplifying the publishing process for authors, our editors and the Wiley team will all be on hand to discuss your research with you in person.

**Come along and find the right journal for your next paper! Tuesday 2 August, 12 noon, at the World Congress of Soil Science in Glasgow.**

European Journal of  
**Soil Science**

**Soil Use  
and Management**

# Join us for our 75th birthday celebrations at our AGM!

The British Society of Soil Science Annual General Meeting will take place on **Tuesday 2 August from 11:00am – 12:00pm** at the World Congress of Soil Science in Glasgow. Join us on the day for elevenses: we will provide the tea and birthday cake! Join our Board and Council members for an overview of the Society's achievements over the past 75 years at the culmination of our anniversary year – the World Congress of Soil Science! The AGM will also include the announcement of the first Outstanding Contribution Award for a volunteer member who has repeatedly gone above and beyond in supporting the Society.

In line with the changes made to the Society Memorandum and Articles of Association and Bye-Laws last year, for the first time, we will be asking members to vote on the resolutions proposed in advance of the meeting. Members in all individual categories (excluding Corporate Members) are entitled to vote and please submit your responses by **Thursday 14 July at 5:00pm** British Summer Time.

Meeting papers and full details of how to vote are available on our website: [www.soils.org.uk/featured/76th-agm](http://www.soils.org.uk/featured/76th-agm)

*The Society Board has recommended to its members that it supports the following resolutions:*

1. To approve the Minutes from the Annual General Meeting held on 7 September 2021
2. To receive and approve the Trustees' Annual Report and Accounts for the year ended 31 December 2021
3. To approve the reappointment of the Auditors, HSA & Co., for the 2022 financial year
4. To appoint Dan Lambeth as Marketing, Communications and Policy-Making Trustee
5. To appoint Paul Hallett as President Elect 2023 – 2024 (from 1 January)
6. To appoint Mike Palmer as Professional Practice Committee Trustee (from 1 January 2023)
7. To appoint Eleanor Reed as Chair of the Professional Practice Committee (from 1 January 2023)
8. To appoint Bruce Lascelles as Chair of the Grants and Awards Committee

9. To appoint Kara Marsden as Chair of the Welsh Soils Discussion Group
10. To appoint Chris Cattle as Chair of the Northern Soils Network
11. To elect Michael Goss as an Honorary Member.

Both members and non-members are welcome to join us at our AGM. Please encourage your colleagues, who may not be Society members, to join the event and become part of our community.

## Annual Report

Our 2021 Annual Report is available to download, setting out the significant achievements we have made over the past year. This includes organising 26.5 training hours for members, sending 27 email updates, responding to five consultations and representing members as a Non-Governmental Organisation at COP 26. The Annual Report demonstrates the impact which our activities are having and the progress we are making against our strategic goals. Download the Annual Report at: [www.soils.org.uk/featured/annual-report-2021](http://www.soils.org.uk/featured/annual-report-2021)

## £5,000 Early Career Interdisciplinary Grant

We will be offering a grant of up to £5,000 to a team of early career professionals attending the World Congress of Soil Science 2022 who wish to develop their own ideas, build a track record in their chosen soil science discipline(s) and work in multi-disciplinary teams.

Following the success of last year's Interdisciplinary Grant at Eurosoil, participating delegates will create an interdisciplinary team to develop a project linked to one or more of the congress scientific divisions. This grant provides an ideal opportunity to highlight the importance of soil science research and collaboration across interdisciplinary teams for the benefit of the human society.

Teams will need to include at least two attendees or delegates to the congress and

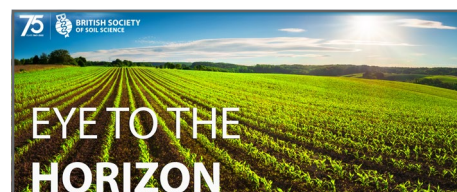
the application must be made by one of these members. In addition, where relevant for the project, the team can propose further partnerships with early career professionals not attending the congress.

A workshop, providing more detail on how to apply for the grant, will be held on **Wednesday 20 July from 10.30am to 1.00pm**. Hosted on Gather Town, an overview of the grant will be provided along with guidance on how to write a successful funding bid, followed by an opportunity to network with your peers to create your multi-disciplinary team. This workshop is a prerequisite to applying for the grant and attendees must book their place in advance. For further details and to register for the workshop, please visit [www.britishsocietyofsoilscience.wildapricot.org/event-4839106](http://www.britishsocietyofsoilscience.wildapricot.org/event-4839106).

## Save the Date: Early Career Networking Event

Join the Early Careers Committee on **Monday 1 August from 1:15 to 2:45pm** for the Early Career Networking Event. Held during the World Congress of Soil Science in Glasgow, it will be a fantastic opportunity for all Early Career members and non-members to meet and get to know each other with some fun activities, including a game of networking bingo!

Save the date and keep an eye out on our website and on the congress app, which will be launched in mid-July, for further details.



## Eye to the Horizon

Earlier this year and with support from the Early Careers Committee, we launched Eye To The Horizon; the new BSSS newsletter specifically for our Early Career (EC) members. It is with great pride that we can say early career members make up 27% of the Society's membership. So what better way to share the resources and news most relevant to EC members with a dedicated newsletter, containing interesting articles, job adverts, events, opportunities, grants and much more!

Eye To The Horizon is published every two months so keep an eye out on your inbox for the next issue.

The Early Careers Committee welcome your content suggestions and you can get in touch with them via [earlycareers@soils.org.uk](mailto:earlycareers@soils.org.uk).



# Visit Britain and NatureScot

## Visit Britain

Supporting England's tourism industry, driving inbound visitor spend, providing expert advice to industry and to Government, Visit Britain are the national tourism agency, a non-departmental public body funded by the Department for Digital, Culture, Media & Sport (DCMS). They were established by the Development of Tourism Act 1969 and undertake Britain-wide and England-specific activity. Their role is to drive immediate tourism recovery from the COVID-19 pandemic, by building back visitors and supporting the industry.

## NatureScot

NatureScot work to enhance Scotland's natural environment and inspire the people of Scotland to care more about it. NatureScot believes that a nature-rich future, where everyone is involved, will make us all happier, healthier, wealthier and more equal.

Restoring and growing Scotland's biodiversity starts with us all. NatureScot aims to strengthen understanding and people's connection to Scotland's natural environment, focusing on the diversity of nature where people live, work, visit, heal and play. Their seasonal campaign Make Space for nature shows what you can do as an individual.



## World Congress Tartan

No fabric embodies Scotland quite like tartan, it is woven throughout its history and into its identity.

To celebrate the World Congress of Soil Science taking place in Scotland, it seemed only fitting to commission our very own, exclusive, pattern. Woven in Scotland by Ingles Buchan, a family-owned firm producing authentic tartans, the tartan is 100% wool.

There will be a range of items to choose from including shawls, scarves, bowties, scrunchies, and pocket squares. Make sure to pick up your preferred accessory!

Available to pre-order from the BSSS online shop now: [www.soils.org.uk/shop](http://www.soils.org.uk/shop)

## Rabbie's Tours

We have partnered with Rabbie's to give delegates and accompanying persons attending the World Congress of Soil Science an exclusive 10% discount when you book directly before 7 August 2022 on all day and multi-day tours from Glasgow between the 27 July 2022 – 8 August 2022.

Rabbie's expert guides lead you through the must-see sights of Scotland. You explore the epic natural wonders, cute traditional villages, and ancient castles. And on all their tours, you learn from the best storytellers, explore in small groups of 16 passengers or less, support local communities, enjoy guaranteed departures, and get a guaranteed experience or your money back.

[www.22wcss.org/activities/cultural-tours](http://www.22wcss.org/activities/cultural-tours)

## The Glasgow Distillery

With WCSS22 occurring in Glasgow this year, we are celebrating local suppliers and bringing our delegates the best of their produce. We are pleased to announce that one local supplier you can look forward to seeing is The Glasgow Distillery. They are a contemporary urban distiller with a focus on handcrafting, who have won numerous awards for their efforts, including Scottish Whiskey Distillery of the Year 2020. Each of their spirits adhere to their three cornerstones of quality, authenticity and innovation whilst also telling fascinating - and often forgotten - stories of Glasgow's past.

Check out the shop at the Congress to get your hands on these unique spirits!

[www.glasgowdistillery.com](http://www.glasgowdistillery.com)



# Zoom into Soil: Soils in Scotland

On Wednesday 2 February 2022, we hosted our second webinar of the year, *Zoom into Soil: Soils in Scotland*, supported by VisitBritain and NatureScot in the build-up to the World Congress of Soil Science 2022.

## The Soils of Scotland: An Overview

By Dr Allan Lilly, Senior Soil Scientist at the James Hutton Institute

Dr Allan Lilly began his presentation by highlighting why characterising soils in an environment is important and stressed that soil is a finite resource and needs to be carefully managed to retain its functionality for future generations. This can be challenging to achieve where there is conflicting interests of land use between farming, forestry, recreation, windfarms, and infrastructure. Systematic soil surveys can help to characterise and quantify one of the major environmental resources and provide a basis on which to make informed decisions about the optimum land-use and management in the future. Allan spoke about how systematic soil classification allows for the experimental data and modelling from one site to be used to draw inference for the management of similar sites without the need for further experimentation.

Allan presented a brief history of the Soil Survey of Scotland; systematic surveying began in 1938 and continued to around 1986. Originally the focus of the surveying was to assess soil characteristics for tree growth for forestry purposes. However, the



outbreak of the second world war led to the focus switching to agricultural production. Today, the focus is to make soils data more accessible and to quantify changes in soils and the environment. In addition to mapping the soils of Scotland, much data was gathered on soil characteristics which now forms the basis of today's Scottish Soils Database.

Allan gave an overview of the relevant

soil forming factors that have affected soil development in Scotland. The glacial history of the Scottish landscape around 22,000 years ago has formed most of the topography features in the country, as well as re-setting the time for soil formation in Scotland to 12-15,000 years. Scotland has 52 of the 56 peaks over 1000m in the British Isles, and as such has many soils at elevated altitude in cold conditions. Allan explained the spatial spread of geological parent material across Scotland, particularly important as the soil associations in Scotland are largely formed on rock type due to the limited soil-formation time.

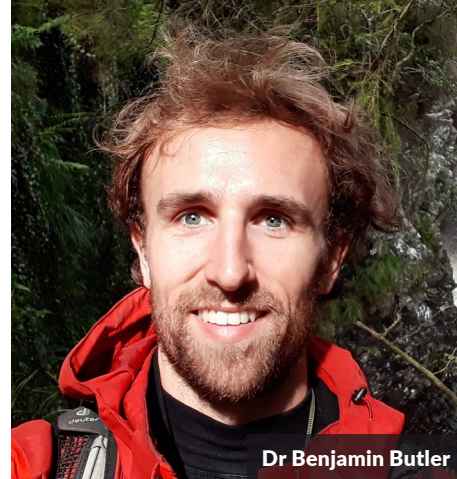
Allan also spoke about the importance of land cover as a soil-forming factor and how land cover changes over time. In the modern day, arable land covers 12%, improved grassland 13%, and forestry 18% of the Scottish land area. However, between the glacial period and the bronze age the majority of Scotland was forested.

In summary, Scotland has a cool and wet climate, high altitudes, loamy acid drift, and little time for soil development. All the soil forming factors combine to create a complex pattern of soil types across the country, which include many peats (Histosols), mature brown earths (Cambisols), and peaty gleys (Histic gleysols/stagnosols).

## The Mineralogy of Scottish Soils

By Dr Benjamin Butler, Digital soil mineralogist at the James Hutton Institute

Dr Benjamin Butler began his presentation by explaining that Scotland is a fascinating place to study soil mineralogy due to the diverse geological history, with many different minerals being found across the soil types in the country. Soil minerals are natural occurring solid inorganic substances with well constrained chemical compositions and specific chemical structures. They are the main component of most soils, with most soils containing between 5 - 20 detectable mineral groups, and as such are intrinsically linked to many soil functions. The minerals within the soil are inherited from parent material or from the products of aqueous alteration (weathering) and those minerals from parent material (clay minerals + FE-oxides).



Dr Benjamin Butler

In Scotland, most of the minerals in the soil strongly reflect the minerals found in the parent material that the soil is formed from. This is because the soils in Scotland are relatively young (12-15,000 years) and therefore the alteration products, such as clay minerals + FE-oxides, have not had long to be formed by the weathering process.

The different soil mineral compositions found across Scotland can be grouped into soil associations. These associations developed from the same parent material and therefore exhibit a characteristic mineral composition. Across the country, there are over 100 different soils associations, which is a high diversity for a small land area. The 20 largest associations cover over 80% of the country's land area, with the largest single association extending for over 12,500 km<sup>2</sup>.

Ben presented quantitative estimates of the mass of the mineral fraction from 42 soil associations across Scotland and used this to summarise the main mineral groups and their spatial variation. To do this, he used the process of X-ray powder diffraction, a technique that uses the way x-rays interact with the atomic arrangement of the material to create a unique diffraction pattern for each mineral. Thus, it can be used to identify what mineral and concentrations are within that soil.

Over the past five years, Ben has quantified the mineral concentration of hundreds of soil samples from across the country. He has found that seven mineral groups account for close to 90% of the soil mineral composition by mass on average in Scotland: Quartz, Plagioclase, Muscovite/illite, K-feldspar, Illite/smectite, Kaolinite, and Chlorite. He summarised the characteristics of these soil minerals and their variation across the country. He has found that soil mineral composition in Scotland shows substantial spatial variation and much reflect the composition of the parent material. Quantifying the mineral composition of the soil in this manner helps to explain and predict soil properties and functions for researchers and land managers.

The full webinar is available to view free of charge via the BSSS YouTube channel: [www.youtube.com/user/BritishSocietyofSoil](https://www.youtube.com/user/BritishSocietyofSoil)



# Zoom into Soil: Peatlands of Scotland

On Wednesday 6 April 2022, we hosted our fourth webinar of the year, *Zoom into Soil: Peatlands of Scotland*, supported by VisitBritain and NatureScot.

## Peatland Restoration: Lessons to Learn From the Peat Face

By Andrew McBride, Peatland Action Manager

Andrew McBride began his presentation by explaining how we still have a lot to learn when it comes to peatland restoration and that using lessons and mistakes from the past to help inform future decision making is vital. Andrew commented how humans have been trying to drain peat land from as early as the eighteenth century, digging drainage ditches and adding boreholes to these environments. However, in many cases, the peatland is tremendously resilient and in the face of these actions, many Scottish peatbogs exist to this day but in need of restoration.

Peatland restoration began in the 1980's in Scotland, with 47,000 ha of peatland benefitting from early restoration measures. However, not all those restoration measures were effective. In the first instances of peatland restoration, the process was hindered by lack of funds, and therefore a lot of the work was done manually and often involved minimal intervention. At this time, it was mainly management changes that were implemented which involved removing livestock from the land and adding dams to the drainage channels. In his experience, Andrew found that a total removal of livestock was not always an effective peatland restoration technique, and some focus should be on setting correct stocking rates for specific environments.

Since the early work in the 1980's, peatland restoration has significantly upscaled due to changes in Scottish government policy and the advent of Peatland ACTION Project, a national programme to restore peatlands across Scotland. It is led and funded by Scottish Government and delivered in partnership with NatureScot and supporting agents; the National Park Authorities (Cairngorms and Loch Lomond and the Trossachs), Scottish Water, and Forestry & Land Scotland. So far, the programme has spent over £30m which has been used to begin the restoration process of 25,000ha of degraded peatland, invested in 200,000ha of feasibility studies and delivered 270 days of training. Andrew spoke about how policy change has been a key driver to the successes of this project and peatland restoration is now at the heart of a lot of climate change mitigation policy.

Andrew explained that one of the most difficult and time-consuming things in a large-scale restoration project is the social and communication aspect. How do we help

people to understand what the problem is? Many peatlands are situated in remote areas and therefore the public and policy makers do not get the chance to see the degradation first-hand. Integrated policy is the key first step to successful restoration. If the policy setting and financial backing are correct, it will help to make the other steps in the project easier and bring additional benefit to the local area. Andrew's key tip was to set long-term instead of just short-term project goals, and always remember that we are restoring our peatlands for the future generations.

The next step for peatland restoration is to "get a grip of the water" through the management of sphagnum moss, known for their impressive water storage capacity and slowing the flow of water in the environment. For successful peatland restoration, you should always be asking 'How do we get sphagnum moss to grow and proliferate here?'. Andrew outlined how to spread water over the total land area, as well as successful applications of tree mulch to create environments for sphagnum moss growth.

Andrew encourages people to begin peatland restoration as soon as possible, otherwise we risk losing biodiversity, momentum in the project progress, and total environmental benefit. Not every action works every time and it always very important to learn from our mistakes!

## A Journey into Peatlands...Through Space and Time

By Dr Rebekka Artz, Senior Scientist at the James Hutton Institute

Dr Rebekka Artz began by introducing why UK peatlands have global importance. She showed a figure which illustrated the global spread of peatlands and described how peatlands are a very important small, but persistent, carbon sink, estimated to account for 30% of global soil organic carbon. However nowadays, due to widespread land drainage and land conversion, global peatlands are also a major carbon source.

Peatland is now estimated to account for 5% of all anthropogenic emissions globally, with the most prolific sources being western Europe and Southeast Asia. This change in global peatland carbon dynamics is a response to only 10% of the global peatland area being drained, which has been enough to result in global peatland changing from a carbon sink to a source. This is the reason why peatland management is very important in the UK, as there is a lot of peatland for a small nation and it is estimated to produce 13.7 Mt CO<sub>2</sub>e per annum, a significant source of CO<sub>2</sub> for the UK.

Rebekka was part of a team who compiled the emission factors for peatland to be used in the UK's greenhouse gas (GHG) inventory. These figures have been used to report on current emissions and progress on reduction strategies for peatland GHG emissions. She presented a figure which plotted the net CO<sub>2</sub>e ha<sup>-2</sup> y<sup>-1</sup> by peatland land use, encompassing land uses in the near to natural state (natural fen, natural bog, rewetted fen and bog) which were classed as CO<sub>2</sub> sinks, with some offsetting from emissions of methane (CH<sub>4</sub>). The more degraded the peatland became through land conversion, the higher the net CO<sub>2</sub> emissions were. The most significant CO<sub>2</sub> emissions were estimated to be from peatland converted to intensive grassland or cropland. She summarised the data by explaining that only the non-natural states of peatland (drained, peat extraction, agricultural) were found to be significant sources of CO<sub>2</sub> emissions, and therefore re-wetting peatland as a management strategy has valid abatement potential for future CO<sub>2</sub> emissions.

Rebekka highlighted the use of peatland restoration as one of the many measures to achieve the national net-zero GHG target. Although there has been good progress in the past few years, to achieve the net-zero target, this progress needs to be accelerated again to bring the estimated remaining >1M ha of peatland in Scotland into some form of restoration project. Rebekka reinforced the importance of collecting correct data to produce robust outcomes and reporting of the success of any restoration measures taken.

Rebekka concluded her presentation with a focus on her recent research, assessing the impact of the water table depth on CO<sub>2</sub> emissions. The study found a strong linear correlation between water table depth and the resulting CO<sub>2</sub> emissions from the peatland, as well as an in-verse non-linear relationship between the water table depth and CH<sub>4</sub> emissions. In a well-drained site, there is high CO<sub>2</sub> emissions and in a water-logged site, there is high CH<sub>4</sub> emissions. The results of the research show that there is a sweet spot of minimal CO<sub>2</sub> and CH<sub>4</sub> emissions at a water table depth of 5cm – 10cm below the surface of the peatland where the site is estimated to become a net GHG sink. Rebekka and her team plan to explore the results of this study in more depth in the future and identify site specific variation in different environments.

To watch this webinar back in full, please visit the BSSS YouTube channel: [www.youtube.com/user/BritishSocietyofSoil](https://www.youtube.com/user/BritishSocietyofSoil).



## Scientific Programme

# Soil Science: Crossing Boundaries, Changing Society

The Congress theme, *Soil Science – crossing boundaries, changing society*, will focus on the link between soil and society, with sessions covering soil systems, soil processes, soil management and how we interact with and use soils around the world. There will be opportunities for specialist workshops and discussion sessions across a wide range of soil disciplines. The core programme is supported by tours and a cultural and arts programme for delegates and the wider public to explore our diverse environment and culture.

The full programme is available to view via the WCSS 2022 website: [www.22wcsc.org](http://www.22wcsc.org)

### Day One – 31 July

- › Opening Ceremony at the SEC (live-streamed)
- › Welcome Reception at the Glasgow Science Centre

### Day Two – 1 August

- › Plenary Session: Soils and Security – Professor Ismahane Elouafi (live-streamed)
- › Interdivisional 1: Spatial decision making and mapping for implementing policies for sustainable soil management (live-streamed)
- › Interdivisional 2: Soil Carbon – from particle to planet (live-streamed)
- › Interdivisional 3: Interdisciplinary soil science for impact (live-streamed)
- › Division 1 Commission 1.2: Soil geography – basic science and new technologies
- › Division 2: Nitrogen Cycling and Soil Health
- › Division 4 Commission 4.5: History, philosophy and sociology of soil science
- › WG1.01: Progress in understanding cryogenic soils at the end of the Earth – mountainous, polar and periglacial regions
- › WG1.04: Global soil map; main advances and ways forward
- › WG1.9: Advances in understanding soils as reflected by the 4th edition of the WRB
- › WG2.1: The Legacy of Henry Lin and the Future of Hydropedology
- › WG3.1: General Meeting of the acid sulfate soils working group
- › Early Careers Networking Event
- › Fringe Event: Global Soil Health Programme

### Day Three – 2 August

- › Policy Programme (see page 18)
- › Plenary Session: How transforming land use change could change our future – Dr Debra Roberts (live-streamed)
- › Interdivisional 4: Plant soil interactions and their roles in soil formation and sustainable crop production (live-streamed)
- › Interdivisional 6: Dynamics of soil erosion and land loss under present and future environments (live-streamed)
- › Interdivisional 9: Novel methods and techniques (live-streamed)
- › Division 1 Commission 1.4, Commission 1.6: Soil classification and palaeopedology
- › Division 2 Commission 2.3: Soil microorganisms under changing environment
- › Soil Genesis
- › WG1.8: Advances in universal soil classification
- › WG3.2: Advances in innovative technologies and methods for quantifying biogeochemical cycles of carbon and nutrients in forest soils
- › WG3.2: Carbon and nutrient cycles under intensifying climate change and land management
- › WG3.4: Mitigation and adaptation strategies for climate change in rice-based systems
- › WG3.4: Recent advances in nutritional, biological and physical processes in paddy soils
- › BSSS Annual General Meeting & 75th Anniversary Celebration
- › Kiss the Ground: Screening of the Netflix documentary
- › Fringe Event: STARS Session

## Other things to see...

Our Living Soil: see pages 22 to 24 for more information!



Facebook: @WCSS2022 [www.facebook.com/WCSS2022](https://www.facebook.com/WCSS2022) Twitter: @WorldSoils2022



## Day Four – 3 August

- › Plenary Session: Rock dust – a reverse weathering mechanism for tropical soils: physical and economic aspects – Professor Suzi Huff Theodoro (live-streamed)
- › Interdivisional 5: Soil science and the emerging philosophy of regenerative agriculture (live-streamed)
- › Interdivisional 7: Soil securing humanity / Humanity securing soil (live-streamed)
- › Interdivisional 8: Sustainable land use (live-streamed)
- › Division 1 Commission 1.5: How Pedometrics can cross boundaries and change society
- › Division 2: Sustainable use of legacy soil phosphorus
- › Division 3 Commission 3.1: Soil evaluation and land use planning
- › Division 3 Commission 3.2: Soil water, pollutant and gas movement in the context of a changing climate
- › WG1.2: Digital soil mapping – advances towards Digital Soil Assessment
- › WG1.3: Progress in Digital Soil Morphometrics – deeper and more precise soil observations
- › WG1.5: Sensing soil chemical, physical and biological properties – advances and emerging techniques
- › WG2.2: Modelling soil processes from ped to global scale
- › WG4.1: The application of Soil Science in the Criminal Justice System
- › WG4.2: Culture and Soil – Outlook and insights from around the world
- › Fringe Event: Soil Benchmark
- › Fringe Event: Forensic Soil Science – Police Scotland
- › Gala Dinner

## Day Five – 4 August

- › Plenary Session: Empowering Soil Scientists with Data-Driven Techniques – Dr Ranveer Chandra (live-streamed)
- › Interdivisional 10: Land contamination and degradation, including Urban Land (live-streamed)
- › Divisions 1 and 2 Commission 1.1, Commission 2.1: Soil structure – Observations, resilience and its role in ecosystem functioning
- › Division 2 Commission 2.2: Biogeochemical cycles in the soil – processes linking the abiotic and biotic realms
- › Division 2 Commission 2.3: Soil biology in transition – from descriptive to mechanistical understanding
- › Division 3 Commission 3.3: Effects and processes of biochar and soil organic matter on plant nutrition
- › Division 4 Commission 4.4: Soil education – in School, university and In-Service training
- › WG1.6: Soil information standards and systems – current initiatives and advances
- › WG1.7: Advances in soil monitoring
- › WG3.1: Acid sulfate soils, sulfidic materials and wetland soils
- › WG3.3: SUITMA – Soils of Urban, Industrial, Traffic, Mining and Military Areas
- › IUSS Gender Balance Meeting including division 26
- › Fringe Event: Global Soil Health Session 2
- › Fringe Event: Ecological Continuity Trust
- › Fringe Event: Sustainability and the World Congress of Soil Science 2022
- › Fringe Event: ReCon Soil
- › Closing Ceremony (live-streamed)

## Poster Presentations

In-person and online poster presentations will be held at the following times:

- › Poster Session 1: 1 August – 13:00 to 15:00
- › Poster Session 1: 2 August – 11:00 to 13:00
- › Poster Session 2: 3 August – 12:30 to 14:30
- › Poster Session 2: 4 August – 11:30 to 13:00

# Sustainable natural systems and effective global policies: how to protect a resource that supports life on Earth

**Tuesday 2 August – 10:00am - 5:30pm**

The Soil Policy event will be the first session of its kind at the World Congress of Soil Science, drawing together an expert group of invited speakers to discuss the complexities, challenges and opportunities of soil policy and governance.

Soils are a diverse component of all terrestrial ecosystems, providing a wide range of ecosystem services that are important for our environment, society and economy, including food production, water regulation and climate regulation. This provisioning of ecosystem services has resulted in their overuse and exploitation from many different users, often exceeding the boundaries of the natural system.

The speakers, over three sessions, will explore a range of topics, including the practicalities of regulating soils; the effectiveness of current soil policy; how action can be implemented considering the range of stakeholders involved; what future soil policy could look like; and how to ensure the delivery of positive changes essential to not only reverse the degradation of soils but also ensure the future, sustainable use of all soils.

The Soil Policy sessions will be accessible for anyone attending the Congress with an in-person delegate pass for the 2 August. Single day delegate passes are available for those wishing to attend select elements of the programme without committing to the full scientific programme.

## Session 1 Priorities and Strategies for Sustainable Soil Management

This first session will frame the context of this first Soil Policy event, introducing the complexities, priorities and strategies necessary for sustainable soil management.

## Session 2 Delivering Effective Soil Policy Through Science

Speakers from a range of sectors and countries will explore how science is communicated beyond researchers and how the impact of research can be improved, including influencing behaviour change to achieve sustainable soil management through policy makers, land managers and regulators to effectively deliver multiple benefits.

## Session 3 Achieving Behavioural Change in Sustainable Soil Management

The session will explore the next steps necessary to achieve the goals explored

throughout the day, including the opportunities and the challenges.

To conclude the Soil Policy event, invited speakers will participate in a panel discussion to explore in more detail the main challenges and solutions necessary to ensure that soil policy is successfully delivered and adopted at the right scale considering the needs of the users, to enable its sustainable use and contribution to environmental targets such as net zero; climate change mitigation and adaptation; food security and biodiversity recovery. Questions will be taken from the audience throughout the Policy Session for the Panel.

For more information on the Policy Programme and details of the confirmed speakers, please visit [www.22wcsc.org/programme/policy-programme](http://www.22wcsc.org/programme/policy-programme).

### Speakers include:

- › **Elena Havlicek** – Scientific Officer Federal Office for Environment FOEN – Soil and Biotechnology Division
- › **David McKay** – Head of Policy (Scotland) at the Soil Association
- › **Cristine Morgan** – Chief Scientific Officer at the Soil Health Institute
- › **John Gilliland** – Director of Agriculture & Sustainability at Devenish Nutrition
- › **Phil Jarvis** – Chairman of Environment Forum at NFU
- › **Ellen Fay** – Founder & Executive Director at the Sustainable Soils Alliance (SSA)
- › **Arwyn Jones** – from the Joint Research Centre at the European Commission
- › **Mathew Williams** – Chief Scientific Adviser (CSA) Environment, Natural Resources and Agriculture at the Scottish Government
- › **Jack Hannam, Carmen Sanchez-Garcia and Erik Button** – Welsh Government Soil Policy Team from Cranfield University, Swansea University & Bangor University
- › **Ronald Vargas** – Soil Scientist at Global Soil Partnership (GSP)
- › **Johan Bouma** – Emeritus Professor of Soil Science at Wageningen University
- › **Ruedi Stähli** – Scientific Officer at the Swiss Federal Office for Environment FOEN

# World Congress of Soil Science and the UN Sustainable Development Goals

We strive to secure the future of soils by promoting an enhanced understanding of the critical importance of soils in delivering the U.N. Sustainable Development Goals and supplying knowledge, through our science, to support efforts to halt and repair soil degradation. The World Congress of Soil Science 2022 (WCSS22) is being developed with these goals in mind.

## Soils' role in achieving the UN Sustainable Development Goals

To support the Society's aim of highlighting the importance of soil in achieving the UN Sustainable Development Goals, the World Congress has developed four short videos. The one-minute long videos Life on Land (SDG 15), Zero Hunger (SDG 2), Sustainable Cities and Communities (SDG 11) and Clean Water and Sanitation (SDG 6) are aimed at non-scientists. The awareness-raising videos provide an overview of the importance of soil, based on the evidence-base.

Life on Land and Zero Hunger were released in June with the Sustainable Cities and Water videos due to be released in July 2022. All videos will be available on the Society's YouTube channel and please share them with your networks and in outreach presentations that you may be giving.

[www.YouTube.com/BritishSocietyofSoil](http://www.YouTube.com/BritishSocietyofSoil)





## How we are implementing the UN Sustainable Development Goals during the congress:



- We provided bursaries via WCS22, £10,000 via our supporters, Macaulay Development Trust and £9,250 via BSSS
- The Congress will be streamed to provide those unable to travel to Glasgow with the opportunity to access the programme
- Those unable to travel can present 'pico presentations', a way to share their research with in-person and virtual delegates



- During the Congress we will be doing our bit to avoid food waste, highlighting to delegates the previous day's waste to encourage lower wastage
- We will be offering a range of nutritious food at the Congress, including plant-based options
- We will be highlighting the CO2 needed to produce each plate of food



- We will be offering a number of social activities aimed at getting delegates moving during the Congress.



- The Congress outreach activities will see us work with the Glasgow Science Centre and the Centre for Contemporary Arts to highlight soils' importance to a wider audience. Activities will be available for all to download via the BSSS website
- The International Union of Soil Sciences (IUSS) will be gifting copies of its latest children's book to Glasgow City Council
- Delegates from World Bank classified Low Income Countries are eligible for concessionary registration rates.



- Three out of four Plenary Speakers presenting at the World Congress of Soil Science 2022 identify as women
- The Working Group steering the development of the World Congress of Soil Science has a balanced gender
- Blind abstract reviewing was undertaken to ensure a bias-free approach to abstract marking split.



- Water stations will be available throughout the Congress venue and delegates will be encouraged to refill their own bottles
- Reusable coffee cups will be available for delegates to purchase and using one will result in a discount for each coffee purchased in the SEC



- The SEC has a Green Tourism Award and is committed to using renewable energy with 100% of its energy currently from renewable sources
- The main accommodation provider for the Congress, IHG Crowne Plaza, uses the IHG Green Engage System to monitor, measure, and manage their impact on the environment



- BSSS, our Congress organiser Speakeasy and the SEC all promote fair wage and equal opportunities



- We will be working with local organisations and charities to repurpose and reuse as much as possible from the Congress and associated events. This will include donating the activities developed for families at the Glasgow Science Centre to local educational charities



- We provided bursaries via WCS22, £10,000 via our supporters Macaulay Development Trust and £9,250 via BSSS
- The Congress will be streamed to provide those unable to travel to Glasgow with the opportunity to access the programme
- The Congress programme will be available via Congress app and online portal, with paper copies available for those who require it
- Wherever possible, we aim to accommodate the specific needs of delegates planning to attend face to face
- Those unable to travel can present 'pico presentations', a way to share their research with in-person and virtual delegates
- Delegates from World Bank classified Low Income Countries are eligible for concessionary registration rates.



- Delegates will be encouraged to walk or use public transport whilst visiting Glasgow
- Delegates will be able to buy a 5-day pass for unlimited rail travel within the Conference Zone for a reduced price of £5



- The Congress app and online portal will provide delegates with information at their fingertips, reducing the need for printing
- Recycling points will be available throughout the SEC
- Delegates are encouraged to purchase reusable water bottles and coffee cups to reduce waste
- During the congress, we will be doing our bit to reduce food waste, highlighting to delegates the previous day's waste to encourage lower wastage
- Take away lunch portions will be provided in compostable packaging
- We have limited carpeting in the exhibition hall to reduce waste
- Those tendering for services are encouraged to commit to our Environmental Statement.



- Plant-based options will be available for lunches, with all menus clearly setting out their carbon impact
- Delegates are encouraged to purchase reusable water bottles and coffee cups to reduce waste
- All items available from the Congress shop are either made from recycled materials or otherwise sustainably sourced
- Delegates are encouraged to walk in Glasgow where possible, and use the city travel pass
- We have commissioned an Environmental Impact Assessment of the Congress, which will consider how the impacts of the event can be offset further



- Delegates are encouraged to purchase reusable water bottles and coffee cups to reduce waste
- Recycling points will be available throughout the SEC



- A leaflet will be produced setting out how to grow a wildflower garden. Delegates are encouraged to work with their local community to offset their attendance at the congress, by creating a local community garden
- The Congress app and online portal will provide delegates with information at their fingertips, reducing the need for printing



- We will continue to support international soil scientists who wish to further their scientific knowledge in a peaceful and respectful manner

# World Congress of Soil Science Merchandise

Visit our online shop, offering unique merchandise ahead of the World Congress of Soil Science 2022!

Whether you are looking for items to use during the congress or take home gifts as a keepsake from this prestigious international event, we have plenty to offer.

Pick up an organic cotton t-shirt in burgundy or khaki: a classic, essential piece for your congress wardrobe! Perhaps you are looking for an essential and stylish accessory for the congress and beyond with a document bag, bucket hat or bamboo lapel badge. Keep your notes in

one place with a beautiful notebook and stay hydrated with a travel cup and water bottle!

Sustainability has been an important part of our product selection and we have endeavoured to offer as many environmentally-friendly options as possible. Through the orders that you place, you will contribute to our supplier's Tree Planting Program in partnership with climate change champions, Ecologi.

The items in our online shop are available to pre-order for collection during the congress. Any remaining stock will be available at our shop inside the SEC during the event (subject to availability).

**Place your order now to avoid disappointment!**

[www.soils.org.uk/shop](http://www.soils.org.uk/shop)



## WCSS22 Notebook and Bio Pen

Whether you use this for notes during the congress or for work after the event, you won't want to miss the opportunity to take one of these home.

A5 case-bound notebook made in the UK. The cover material is made from a mix of recycled office waste and post industrial waste from coffee cups. The inner paper is white lined and also 100% recycled.

Classic pen made of modern bioplastic. Matt finish barrel made from renewable bio based raw materials. Fitted with large capacity magic flow refill.



## WCSS22 Document Bag

Stay organised and keep everything together with our sophisticated document bag, including enough space for your laptop!

Reach compliant recycled conference/meeting bag made from 300 x 300d RPet (recycled plastic bottles) fabric. With a zipped front pocket, carry handle and adjustable shoulder strap.

Dimensions: 400 x 325 x 80mm

Colour: Navy



## WCSS22 Travel Cup

Re-useable and portable - enjoy your hot drink on the go with our World Congress of Soil Science travel cup! Not only is the cup recyclable, but unlike other plastics, it breaks down much faster. Once disposed of (not that you would want to), it becomes food for microbes within a few years leaving behind no microplastic.

Capacity: 350ml

Dimensions: 155 x 90mm diameter

Colour: White with green lid



## WCSS22 Bamboo Lapel Badge

A small pin badge which can be worn on the lapel of a jacket, attached to bags, or fabric items as a memento of attending the World Congress of Soil Science 2022.

High quality UK manufactured bamboo clutch pin badge in a caramel finish. Made from sustainable bamboo supplies. 35x35mm. All badges are fitted with a self adhesive butterfly clutch pin.



## WCSS22 Bucket Hat

Get on trend with a World Congress of Soil Science bucket hat, offering all day comfort and protection from the elements when out in the field!

M/L - 57cm and L/XL - 60cm

Made from 100% recycled polyester. Colour - Navy.



## WCSS22 Drinks Bottle

Get your congress water bottle and fill up for free during the event! A carabiner offers hands free use and will be great for your office desk for years to come.

750ml single walled glossy aluminium drinks bottle with black screw on PP plastic lid and black carabiner. BPA & PVC free.



## WCSS22 Organic Cotton T-Shirt (Burgundy or Khaki)

A classic, essential piece for your congress wardrobe. The t-shirt is fashioned with soft organic cotton for maximum comfort all day long.

100% Organic Cotton T-Shirt with a ribbed collar, tubular body and twin needle stitching. Unisex t-shirt based on adult male UK sizing





# The Fragile Skin

A chalice of knowledge and learning from over a combined 65 years in soil science, *The Fragile Skin*, co-authored by John Hollis and Allan Lilly, is a valuable and interesting resource for anyone with more than a passing interest in soils.

The Fragile Skin delves deep into how the soils of the British Isles were formed, their unique characteristics, and their management, while providing an unflinching, well-evidenced narrative on what the future may hold for our soils in the face of climate change and other pressures.

With publication fortuitously coinciding with the 75th Anniversary of the British Society of Soil Science (BSSS), this book captures a snapshot of soils in the British landscape and is a fitting celebration of this historical year for the Society. Copies can be pre-ordered for collection at the World Congress of Soil Science 2022, where there will be opportunities to engage with the authors and get your copy signed; alternatively, the BSSS web-shop will be opening for home-delivery orders in mid-August so keep an eye on our newsletters for a launch date!

Purchase your copy now at  
[www.members.soils.org.uk/Sys/Store/Products/297267](http://www.members.soils.org.uk/Sys/Store/Products/297267)

## About the Authors



**John Hollis** graduated in soil science from the University of Newcastle upon Tyne in 1969 and joined the Soil Survey of England and Wales working from their West Midlands office. After 13 years field soil surveying experience, he moved to Rothamsted to assume national responsibility for soil classification and correlation. Following the Soil Survey's move to Cranfield University, he has undertaken major management responsibilities in the fields of soil hydrology and pollutant transfer.

John left Cranfield in 2006 and became an Independent Consultant specializing in soil and water

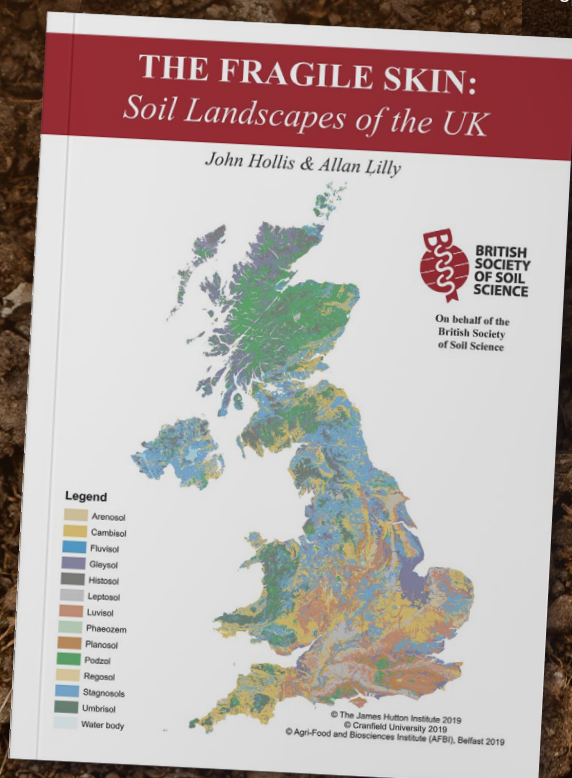
resources and the environmental fate of agrochemicals. He retired in October 2020.

He is the author or joint author of 25 peer-reviewed papers in scientific journals, 17 books or book chapters including 7 soil survey publications with accompanying soil maps, 30 scientific papers for conferences and symposia, 58 Research Reports to Defra, the Environment Agency or the European Commission and over 100 consultancy reports.



**Allan Lilly** has led several Scottish Government funded research activities and developed the field protocols and sampling procedures for the resampling of the National Soil Inventory of Scotland in 2007 to 2009. He has been the Head of the Soil Science and Mineralogy Group at the James Hutton Institute and Chair of the European Soil Bureau Network, a member of the Steering Committee of the European Soil Partnership and of the Pillar 4 Working Group of the Global Soil Partnership and was co-responsible for developing the first European Soil Partnership Pillar 4 (Soil data) Implementation plan. He also has spent time as a visiting scientist with the USDA in Beltsville, Victoria Department of Primary Industries in Bendigo and CSIRO in Canberra, Australia.

His work has come full circle and he now leads a Scottish Government funded project to enhance, interpret and make soil data more widely, and freely, available. Allan has authored or co-authored over 65 scientific papers, 130 contract reports, various book chapters, a number of soil, land capability and risk maps and became a Fellow of the British Society of Soil Science in 2015.





# Centre for Contemporary Art, Glasgow

An exhibition and extensive education and public programme, *We are Compost / Composting the We*, will be taking place at the Centre for Contemporary Art, Glasgow from 29 July to 10 September 2022, with a book publication planned for 2023.

## The exhibition features:

- Absorption - a large-scale room installation of recycled soil materials by the Berlin-based artist, Asad Raza
- Gaia Glossary - a research installation of literature, audio-visual resources and objects by the Weimar-based guest-curator, Alex Toland
- An interactive installation in collaboration with CCA's Seed Library.

The exhibition and wider programme feature examples of radical composting that explore issues of food sovereignty, meal cultures, waste streams, allotment politics, right to land movements, seed saving initiatives, and soils as relational, subjective bodies in multispecies communities that demand

attention and time in all forms of land stewardship.

*The wider programme aims to disperse the ideas and processes outside of the exhibition, covering a range of topics that is presented in a variety of ways for audiences to engage with:*

- A geophagy performance and soil-tasting workshop by Amsterdam-based artist Masha Ru in collaboration with Zone2Source
- Seed saving workshop by Glasgow Seed Library, Glasgow community gardening activists Propagate and Open Jar Collective
- A series of online lecture performances featuring the Composting Feminisms reading group led by Astrida Niemanis

with scholars from the Soil Care Network, and composting artists Susanne Winterling, Amy Franceschini, Claire Pentecost, Debra Solomon, and Annie Sprinkle and Beth Stephens is planned on CCA's online platform Annex

- A closing event in September with performances activating Asad Raza's work in the gallery.

The CCA events will tie in with the soil symposium and film screening event on occasion of the World Soil Science Congress, co-curated with the International Soil Care Network and the Society.

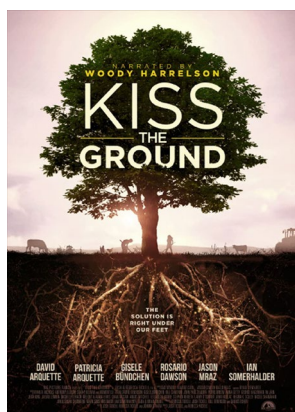
**CCA:** Centre for Contemporary Arts

## Kiss The Ground

Special screenings of the multiple award-winning environmental film, *Kiss the Ground*, will be taking place during the World Congress of Soil Science 2022. Narrated and featuring Woody Harrelson, *Kiss the Ground* is an inspiring and ground-breaking film that reveals the first viable solution to our climate crisis.

*Kiss the Ground* leads that, by regenerating the world's soils, we can completely and rapidly stabilize Earth's climate, restore lost ecosystems, and create abundant food supplies. Using compelling graphics and visuals, along with striking NASA and NOAA footage, the film artfully illustrates how, by drawing down atmospheric carbon, soil is the missing piece of the climate puzzle. It is positioned to catalyse a movement to accomplish the impossible – to solve humanity's greatest challenge, to balance the climate and secure our species future.

Make sure you stop by during the WCSS22 to be part of the experience!



## Soil and Soul

Propagate's Soil and Soul sessions with groups across Glasgow are in full flow as the growing season gathers pace. There has been connection with some fantastic collectives covering many walks of life, from asylum seekers to children and special needs groups, from community gardens to colleges and after school clubs, and with them, an eclectic mix of sessions has been created.

Incorporating exciting soil related content, such as creating worm farms, the why and how of composting, understanding creatures of the soil, and creating soil-related artwork, the project is inspiring the people of Glasgow about soil and why it matters – and building up a body of work to show at the Riverside Museum (with expected footfall of c25,000!) from Tuesday 12 to Monday 18 July.

Soil and Soul are working in partnership with Open Jar Collective to create podcasts, showcasing the voices of those involved in the project, and incorporating The Keeper of the Soils work from North Light Arts. The groups are learning about the utmost importance of soil, and about



how to manage soil in a healthy and sustainable way - work that will continue beyond the conference into the future. Each episode will focus on a different community group across Glasgow and provide a snapshot of the group's experience as they learn about, explore, and reflect on soil. The podcasts will be available from mid-July.



"A mother, lost in a past that is gone. A father, torn apart by the land he loves. A little girl, missing in the fog."

## Digging Deeper

Humans always used to tell stories about soil. Origin stories even told how the first humans were moulded from soil. However, the world has changed. We no longer see the landscape the way our ancestors did. Though we still depend on soil for our survival and it is key to our heritage, we have become physically and emotionally disconnected from it and both have suffered as a result.

It is time we brought soil back into the heart of our storytelling culture.

*Most of rural Scotland is blanketed by soil. This seemingly inanimate surface that we might occasionally worry about when some scientists state that we have only 60 harvests left but which, if we think about it at all, we usually see as just dead dirt. Except it isn't. Because soil is alive and his name is Pete and Pete holds not just the key to our future but to all of Scotland's stories. He's seen them all happen after all. He is The Storykeeper. But the world has changed. Humans who once*

*lived alongside Pete now don't even listen to him. He has been badly damaged and is angry and afraid. Until one day a wee girl hears his voice on the wind...*

Digging Deeper is a six-part audio drama that captures the terrifying drama facing Scotland's soils today and weaves their story with the struggles currently facing small-scale Scottish farmers and a heart-breaking story of personal loss.

Written by Isla Robertson, you can watch the teaser trailer now via [www.youtube.com/watch?v=vZpMXwHdQQA](https://www.youtube.com/watch?v=vZpMXwHdQQA)



"For hundreds of years I have lain silent with no one to hear me. Until... she listened"

# soil voices

## Soil Voices

Soil Voices is a project that came to life in 2020 with the help of seed funding from BSSS. Soil Voices has been raising awareness of the importance of soil, particularly amongst people who are not normally interested in it, by bringing soil back into the heart of human storytelling culture. They gather personal stories that show we all have a relationship with the soil and these are uploaded to their website where you can add your own story or memory and also listen to other stories from around the world – [www.soilvoices.org](http://www.soilvoices.org)

You can also read shorter mini-stories on the Soil Voices Instagram account where they try to give the soil a voice – [www.instagram.com/soilvoices](https://www.instagram.com/soilvoices) and see what else they are up to on their Twitter account – [www.twitter.com/SoilVoices](https://www.twitter.com/SoilVoices).

With some extra funding from the IUSS, Soil Voices has been running creative soil workshops where participants learn all about how important soil is and then respond to soil in a mindful and creative way through writing. The workshops have been delivered as far afield as a school in Kenya as well as more locally in the UK, including to several schools in Devon and Somerset. They have just been invited back for a second time to work with the Black2Nature group from Bristol, that aims to ensure that access to nature is available to ethnically diverse young people.

Going forward, Isla Robertson is further developing the Digging Deeper audio drama and Jude Allen is in the process of developing the workshops for a corporate audience, going into businesses, and using soil and story to help employees re-connect to their workspace after Covid.

## The Scottish Potters Association

The Scottish Potters Association will be holding an exhibition during the World Congress of Soil Science 2022 entitled Wild Clay.

Soils are part of the landscape and over time, soils have informed many traditional practices; of which perhaps no tradition is older, or more enduring, than the creation of vessels. These vessels can, through time, tell us much about civilisation; but what can these items tell us about the

landscape, the soils, they come from? How do these vessels go from a raw, unprocessed form to object of value?

This exhibition aims to explore the Scottish landscape through the lens of the ceramics birthed from it. The exhibition will feature local artists and will run for the duration of the congress.



# Science Centre

GLASGOW  
**SCIENCE  
CENTRE**  
Celebrating 21 years

To celebrate the World Congress of Soil Science, we will be hosting some fun, hands-on activities at the Glasgow Science Centre from Monday 1 to Friday 5 August!

The outreach activities planned will inform attendees about soil's role in the climate emergency, and provide information and advice on the role everyone plays in sustaining our soil for the future, including links to achieving the UN Sustainable Development Goals.

During our week's residency, 20 scientifically trained volunteers will work with families attending the Glasgow Science Centre, helping host several hands-on engagement activities,

allowing them to experience various aspects of soil function and biodiversity. This will include activities exploring the impacts which climate change has on erosion, clean water and soil health, and in addition we will provide practical suggestions for activities and experiments which families can take away with them to complete at home.

We hope to present more than 5,000 people with the information they need to make a positive, sustainable difference

to their own garden, school field or local park. The community will be encouraged to post their images and feedback from the resources on social media, inspiring others and sharing the importance of soil.

Come along and meet our friendly volunteer soil scientists and professionals, ask them everything and anything, and have fun doing some great soil experiments. We invite you to come and share our world; we just hope you don't mind getting your hands dirty!

## ACTIVITY 1 WHAT IN EARTH?

**There are all sorts of creepy crawlies, slimy survivors, and fabulous fungi to discover; but watch out for those pesky interlopers! Come with us, dig for yourself, and explore the amazing hidden world of soil and its importance to life as we know it.**

What in Earth? centres around a simulated soil pit. We will recreate the experience of digging through soil, examining its biodiversity and components, in an indoor-friendly format. There will be toy worms and other bugs, fake leaves and mushrooms, bits of plastic, fossils, imitation foodstuffs such as potatoes, and some false animal 'poop' to discover. To help represent that a teaspoon of healthy soil contains over 10 billion organisms; more than there are humans on the planet, children will use an oversize teaspoon and discussion will centre on the importance of healthy soils to ecosystem function and the wider climate.

## ACTIVITY 2 JAM JAR EXPERIMENT

**Shake it - shake it all about! Come show us your moves in the name of science! Shake jars of dirt to solve the puzzle of why soils behave differently in different places. This experiment will introduce all the things soil is made of and how they behave in water.**

The Jam Jar Experiment centres around the ways different substrate media behaves with the use of marbles, glass beads, sand, eco glitter and compost. Children will be invited to hypothesise what will happen when the different jars are shaken before being asked to shake the jars 'as hard as they can!'. They will then be encouraged to observe how quickly the sediment settles, how some split into components, and how they colour the water. Discussion will focus on the importance of soils for retaining water in the landscape, flood mitigation, run-off and some elements of soil contamination.

## ACTIVITY 3 SOILS: SUPER SPONGES?

**A space the size of a standard football pitch can hold up to an Olympic swimming pool's worth of water; that's a lot! Some soils are better than others though and how humans treat our soil makes a big difference. Take part in our experiment and pour water all over our 'soils'; do you know what will happen next?**

Soils: Super Sponges? will contrast with the jam jar activity and explore the water retention properties of different soil types. Using bottles lined with coffee filters and then filled with soil substrates (gravel, sand, compacted silt, compost, and a traditional shaped sponge), children will be invited to hypothesise which will hold the most water and how quickly it will go through. They will be asked to pour over some water and watch what happens, discussing the impacts of soil erosion and compaction, and discovering that healthy soil is important to landscape-scale water management.



# Corporate Membership

Becoming a Corporate Member of BSSS demonstrates to your staff and customers that you care about soil and are building a collaborative partnership to help safeguard our soil for the future. Join us and help make a positive difference in the sustainable management and long-term security of soils that is critical to solving the environmental and societal challenges we face today.

## Our Corporate Members



## Welcome to New Corporate Members!

We are delighted to welcome two new members to the Society: Cranfield University and Kabloom.

### Cranfield University

As a specialist postgraduate university, Cranfield University is recognised worldwide by industry, government and academia for their research and teaching in plants, soil, water and air. They contribute to enhancing natural capital and ensuring that global food systems are more resilient for the future.

### Kabloom

Kabloom make fun and innovative planet-friendly products designed for interaction. Their products are inspired by their (cultures) relationship with nature and the urban environment.

## Testimonials

### ADAS

*"ADAS is delighted to be a corporate member of BSSS. We fully support the Society's aim to make a positive difference in the sustainable management and long-term security of soils. ADAS' values and ambitions are closely aligned with the Society's new strategy and 10-year vision for the future of UK Soil Science."*

**John Williams, ADAS Head of Soils and Nutrients**

### Ecological Continuity Trust

*"As a growing small charity in the environmental sector, the Ecological Continuity Trust (ECT) is looking to build strategic partnerships with key organisations that can enhance the value of long-term ecological experiments for mutual benefit. Our burgeoning partnership with the BSSS is one such example, leading to reciprocal activities which raise the profile of long-term field ecology and soil science, helping to bring these two domains into closer collaboration. The BSSS team are a pleasure to work with, highly professional and full of creative ideas. ECT looks forward to many years of productive partnership between our organisations."*

**Ben Sykes BSc(Hons) MSc MRSB, Executive Director**

## PACKAGE DETAILS

### What is included?

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>» Corporate Membership Scheme certificate</li> <li>» Acknowledgement, link and blog opportunities on BSSS website</li> <li>» Use of "Corporate Member of the British Society of Soil Science" and a specifically designed logo</li> <li>» Access to BSSS' two scientific journals for one nominated contact</li> </ul> | <ul style="list-style-type: none"> <li>» Members' e-newsletters</li> <li>» One ¼ page advertisement in <i>Soil Matters</i></li> <li>» 20% discount on additional advertising in <i>Soil Matters</i></li> <li>» Free unlimited job advertisements on the BSSS website</li> <li>» Members' discount on BSSS conference and event tickets (unlimited when booked through the company)</li> </ul> |
|---|---|

### Membership Fees (based on annual turnover)

Up to £250k	£399 +VAT
£250k – £1m	£599 +VAT
£1m – £5m	£799 +VAT
> £5m	£999 +VAT

*A discount on the membership fee will be offered to charities or not-for-profit organisations.*

**ADAS**

## We're hiring!

- Soil & Water Scientists/Consultants
- Soil & Land Drainage Surveyors
- Agri-Environment Consultants

All grades required  
Competitive salary & flexible benefits

**Join the UK's largest independent agricultural & environmental consultancy**

**[www.adas.co.uk/careers](http://www.adas.co.uk/careers)**

# Grants

BSSS is dedicated to promoting the study and profession of Soil Science as well as supporting and encouraging excellence within the discipline. To achieve this, we offer several grants:

## Members

- › **Early Career Conference Grant** – Available to BSSS Early Career members to help fund attendance at conferences applicable to their research field. This year's Early Career Conference Grant was fully awarded in March 2022 with each award worth £500. Check back in early 2023 for the re-launch of the grant!
- › **Public Engagement Grant** – Available to BSSS members to undertake public engagement activities communicating soil to diverse audiences. Value of up to £250.
- › **David S Jenkinson Fellowship Grant** – Available to support early career postdoctoral scientists from the UK to travel and collaborate with an overseas organisation. Suitable for Society Members who are UK residents and employed. Value of up to £5,000 annually.
- › **Brian Chambers Soils Fund** – Career development funding to help early career

scientists and practitioners develop skills and knowledge needed to manage soils effectively in modern farming systems, essential for the future sustainability of agriculture. Value is based on application (normally between £250–£2500).

## Non-Members

- › **Innovation Grant** – Suitable for teachers of Primary, Secondary and Higher Education Institutions to encourage development of innovative ways of incorporating soil science into lessons. Value of up to £500.
- › **Field Equipment Grant** – Suitable for Primary, Secondary and Tertiary Institutions to purchase field equipment to aid in the instruction and understanding of soil science. Value of up to £1,000.

Visit us at [www.soils.org.uk/grants](http://www.soils.org.uk/grants) for guidelines and application forms or email us on [admin@soils.org.uk](mailto:admin@soils.org.uk).



The Edible Landscapes London team designed and produced a unique card game where schoolchildren can learn about the soil food web and how different groups of soil organisms interact and link together.

**Edible Landscapes**  
London CIC



**GENEVA**  
**Eurosoil 2021**

## Case Study: Early Career Conference Grant By Joseph Martlew

Through my membership of BSSS, I applied for the Early Career Conference Grant to enable me to attend and deliver an oral presentation at EuroSoil 2021. The conference was moved to an online platform and the ECR Conference Grant enabled me to meet the registration fee.

EuroSoil 2021 was the official international congress of the European Confederation of Soil Science Societies. The event brought together research scientists and stakeholders in sessions that were organised to reflect the themes of the UN Sustainable Development Goals. This novel approach to the conference session structure resulted in a large variety of presentations and diverse discussion, covering a wide range of topics from urban soil policy through to modelling degraded soil recovery at ecosystem scale. I gave an oral presentation on my PhD research *Quantifying and alleviating subsoil compaction in arable soils to the session Targeting land degradation neutrality! Degradation, restoration and conservation of soil functions in a changing global environment*.

EuroSoil is a key international conference in the soil science community and having my abstract selected for an oral presentation was a privilege. Presenting the PhD research gave me the opportunity

to discuss the methodologies and results of the work with an international audience of soil scientists and stakeholders. I was able to develop my visual and oral data presentation skills, and the Q&A session that followed required me to discuss and defend the results. This was valuable as core skills development for future work in applied soil science, the critical discussion helped to develop revisions for the journal publication process, and the discussion and defence acted as excellent preparation for my PhD viva.

Throughout the conference, I attended numerous sessions outside of that in which I presented. These sessions afforded me the opportunity to learn about the latest research within different soil science disciplines, to hear from and interact with those keynote speakers who are at the forefront of leading soil science research and to develop my questioning skills during the Q&A sessions.

The personal interaction was limited by the

online platform in comparison to an in-person event. Despite this, I feel I was still able to network with other researchers, gaining contacts and experience. In particular, it was brilliant to hear presentations from those research scientists that have specifically led the field of subsoil compaction research and have the opportunity to find out about their latest work, much of which has not yet been published.

Attending and giving an oral presentation at EuroSoil 2021 provided me with a hugely valuable opportunity to present my PhD research to an international conference, interact with the soil science community (in particular those that lead the field of subsoil compaction research), and to develop some of the core skills I require as a researcher.

I would like to thank the British Society of Soil Science for supporting my registration that enabled me to attend this event as part of the Early Career Conference Grant.





## Case Study: Unearthing the importance of soil with Edible Landscapes London

By Katy Faulkner (Early Career Committee Member)

For the final two weeks of March, the community education project, Edible Landscapes London (ELL), ran soil-themed sessions for local schoolchildren with funding awarded from the Society.

Tucked away in the bustling Finsbury Park, North London, is a forest garden filled with plants and wildlife. The community garden provides a biodiversity haven where people can be immersed in nature and learn about sustainability, forest gardening and the environment.

Walking through the garden, you enter several habitat zones, each a unique learning area. Firstly, pots and beds of a wide range of herbs and vegetables are growing and tended to by local volunteers who learn about the role soil processes and biodiversity play in plant health. Walking further into the garden, you reach an aquatic zone with a small pond, bee houses, three compost areas and a wild garden.

Based at Finsbury Park, ELL run a wide variety of activities and courses from their forest garden, but for March the focus turned belowground to the soil. After a successful application to the Society for outreach funding, the ELL team set to work designing and preparing a wide range of soil-themed activities to engage local primary and secondary schoolchildren with soil science.

In the final two weeks of March, several activity days were led by the ELL team for local schools who were able to enjoy a number of sessions at the forest garden. One of these activities was the Dinner Date card game, where players have to match up their soil organisms to demonstrate how they interact and how the soil food web links together. Another activity was a lively mycorrhizal fungi network game where trees in a forest need to form connections via mycorrhizae (in this instance the

The central learning zone in the Edible Landscapes London Forest community garden on the edge of Finsbury Park in North London. Pots containing a wide variety of herbs, fruits and vegetables can be seen alongside a covered seating area for activities and learning.



mycorrhizae were schoolchildren!), an excellent way to demonstrate the important belowground root-fungal connections and the role these have in plant health.

The most energetic activity was soil digging, with small soil pits dug followed by a hunt for earthworms. Once collected, the earthworms were counted, and the sizes were measured and recorded. Following this, a discussion took place about the role earthworms have as soil ecosystem engineers.

The activities were all very successful at engaging schoolchildren in soil science in a unique setting and demonstrated the importance of soil science for biodiversity, food production and ecosystem stability.

If you are interested in finding out more about Edible Landscapes London and their fantastic work, please visit [www.ediblelandscapeslondon.org.uk](http://www.ediblelandscapeslondon.org.uk)



A very big thank you to a Society member whose kind donation supported five of these bursaries!

## Awarded Grants

The following grants have been awarded so far during 2022 and we look forward to sharing the outcomes of each project with you in due course:

### Early Career Conference Grant

Ana Natalio – £500  
 Anna Abramova – £500  
 Carmen Sanchez-Garcia – £500  
 Catriona Willoughby – £300  
 Deevena Elias – £150  
 Dimitrios Gaitanis – £150  
 Francis Durnin-Vermette – £500  
 Helena Ripley – £500  
 Jennifer Davies – £500  
 Katy Faulkner – £500  
 Lucy Weidner – £500  
 Luke Fountain – £500  
 Mamunur Rashid Sarker – £500  
 Mary Hodgson – £500  
 Matthew Tarnowski – £500  
 Nancy Muringai – £500  
 Mohammad Robel Hossen Patwary – £500  
 Rose Boyko – £150  
 Samuel Booth – £500  
 Silvia Arpano – £500  
 Vanessa Silva Melo – £500

### Field Equipment Grant

Edible Landscapes – £500

### Innovation Grant

Edible Landscapes – £500



# MSDG Regional Meeting

## Agri-Robotics and Novel Technologies in Agriculture

The Midlands Soil Discussion Group (MSDG) hosted their annual regional meeting in May, the Society's first face-to-face event in over two years!

Taking place at the University of Lincoln, delegates explored advancements in Agri-Robotics at the Riseholme Campus. The campus is a 200-hectare mixed farm, located just north of Lincoln city centre, and is home to a mixed farm (arable and livestock), alongside a dedicated strawberry crop research site, walled garden with trial plots for teaching and research, as well as a refrigeration research unit and agri-robotics workshop. Delegates explored the latest technologies being developed to benefit agriculture, including soils mapping and future directions.

One of the technologies on show was the Lincoln Institute for Agri-Food Technology's (LIAT) wheeled robot used to analyse millions of strawberries throughout their growth cycle, monitoring weather conditions and berry appearance to predict the perfect harvest date for each plant. The robot spots each strawberry, including the unripe green ones hidden amongst the foliage, and every berry's location. As a result, the LIAT team can predict the day of perfect ripeness, and the total number of punnets a greenhouse might create 6 weeks ahead of current forecasting systems.

After lunch, three MSDG members presented their latest research/projects:

### Burrowing behaviour of wireworms (*Agriotes* spp.) in maize, barley and bare soil

By Samuel Booth

Click beetle larvae (Elateridae), commonly known as wireworms, are burrowing insects that can be a significant agricultural pest (such as *Agriotes* spp.), reducing crop yields and quality of harvestable parts. X-ray CT was used to visualise and quantify wireworms, their burrow networks and the root architecture of maize, barley and bare soil over a 96-hour time period to monitor the typically cryptic behaviour of these organisms. Wireworm burrow volume was significantly greater in bare soil compared to maize and barley planted columns, suggesting a behavioural difference in the wireworms elicited by the presence of root structures. Burrow networks with



maize were significantly shallower and less complex in structure compared to their barley and bare soil counterparts. Burrow network depth did not vary significantly over time. The presence and species of crop roots caused differences in wireworm behaviour, leading to variation in both the volume and structure of the burrow networks.

### A hybrid approach to soil assessment: integrating farmers' observations and conventional soil testing

By Dr Samuel Eze

There are various programmes across the globe aimed at restoring degraded soils and/or minimizing the degradation of productive soils through the promotion of soil conservation practices. Out of the numerous factors known to influence the adoption of recommended soil conservation practices, farmers' understanding of the soil is a key factor that is often overlooked by researchers. In the presentation, the study approach and key findings from a case study where changes in soil properties under climate-smart agriculture were assessed via a combination of conventional soil testing and farmers' observations were discussed.

### Soil moisture and groundwater dynamics and their impact on wheat yield

By Dr Andrew Tye

The day ended with the MSDG's AGM where Dr Charlotte White was welcomed to the committee and the group agreed to hold next year's meeting in Wolverhampton.





# SEESOIL Regional Meeting

## Climate Change and Land Use in the UK and the Growth of Viticulture

The South East England Soil Discussion Group (SEESOIL) met on a rainy June day at Gusbourne Estate, a 90 hectare site producing vintage wines made from its own fruit.

Introducing the day, Society President **Dr Bruce Lascelles** highlighted the need for a closer working relationship between researchers and policy-makers; using the Environment Bill, which doesn't contain the word 'soil', as a case in point. Although there were increasing number of corporate organisations keen to implement nature-based solutions into their businesses, very few had specific references to soil.

Bruce was followed by ex-SEESOIL Committee member, **Prof John Boardman**, who provided an overview of the 40 years he had spent working with the Breaky Bottom vineyard owner, whose crop and farmhouse was at the bottom of a deep, dry valley, surrounded by a local farm. Following smaller flooding events in the late 1970's, the vineyard had experienced three major flooding events in 1982, 1987 and 2000 and John outlined the various mitigation techniques that had been implemented to prevent flooding from the farm to the vineyard below. These included digging trenches, dams and gullies which did not prevent the flooding and in the year 2000, there were over 20 floods in the autumn and into early spring 2001, even with only 5mm of rain. In this instance, the gullies continued to channel the rainwater and "muddy flooding" into the valley below until vegetation had grown in the spring. Since the events in 2001, there haven't been any other major flooding events. However John believes that the no-till approach adopted by the farmer in 2006, and reverting some arable land back to grassland, had a positive impact. John suggested

mitigation techniques including ground cover between vines, to lessen the risk and impact of flooding.

In the several papers which John has published on the flooding, he correlated that the risk of erosion had increased over the last 100 years as the intensity of rainfall and the number of days with at least 30mm rain, increased.

**Flora O'Brien** (NIAB) and **Marcos Paradelo Perez** (University of Greenwich) outlined the research project they had participated in at the first research vineyard in the UK, hosted by NIAB. The project *Integrated Weed Management: Practical Implementation and Solutions for Europe (IWM PRAISE)* began in 2017 and would complete in late 2022. Its purpose was to identify the impacts on the quality of yield in vines across four separate groups: a control group whose weeds were strimmed back, vines with herbicide treatment applied, and two mechanical weeding groups – one using a finger weeder and a second using a blade weeder. Results from 2020 and 2021 demonstrated that the control group had a third lower yield than the higher performing mechanically weeded groups, whose grapes had higher sugar content which could result in better quality wines. Despite the initial results, Flora highlighted the need to expand the research further and explore soil health, other soil coverings and cover cropping to better understand the link between the vine yield and other local plants. She also highlighted that mechanical cropping may not suit all vineyards and that a mixed approach, including herbicides, may be more appropriate in some scenarios.



Labour shortages were a key discussion throughout the day, with attendees querying whether robotic weeders and planters could be the future for viticulture. Despite this, the Gusbourne Estate Manager highlighted that during each 7 – 10 day harvest period, up to 100 workers were needed in the field at any one time to pick the grapes by hand. Using analysis to identify the amount of sugar in the grapes prior to picking, workers are directed to the vines over the period that they are likely to be at their ripest. Benjamin Brown from Agrii noted that many parts of the UK have a similar geological formation to Champagne in France, and similar grape varieties were used. As planting a vineyard is unregulated in the UK, landowners are increasingly experimenting with growing vines.

The day was topped off by a delicious two-course lunch, a tour of the Gusbourne Estate and tasting of three sparkling wines for sale from the vineyard.

Slides from the day are available in our Members' Area:

[www.soils.org.uk/members-area](http://www.soils.org.uk/members-area)



**GUSBOURNE**  
[www.gusbourne.com](http://www.gusbourne.com)

# Your Council and Committees

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Chair: Sacha Mooney

**World Congress of Soil Science  
2022 Working Group**

Chair: Bruce Lascelles

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**Midlands Soil Discussion Group**

Chair: Iain Gould

**Northern Soil Network**

Chair: Chris Cantle (co-opted)

**Scottish Soil Discussion Group**

Chair: Sarah Buckingham

**South East England Regional Group**

Chair: Leila Froud

**South West Soils Discussion Group**

Chair: Lynda Deeks

**Welsh Soil Discussion Group**

Chair: Kara Marsden (co-opted)

## Council

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**Jenni Dungait**

Editor, European Journal of Soil Science

**Kirsty Elliott**

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**Sarah Garry**

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**Kara Marsden**

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**Mike Palmer**

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**Lois Phillips**

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**Xavier Portell-Canal**

Ordinary Council Member

## Advertising

If you are interested in advertising in a future edition of *Soil Matters*, we have a range of packages available, from quarter to full page adverts and with discounts available for advertising in more than one edition. For further information, please contact [admin@soils.org.uk](mailto:admin@soils.org.uk).

## Vacancies

Our members are able to post unlimited, soil science related job advertisements free of charge on our website [www.soils.org.uk](http://www.soils.org.uk) and in *Soil Matters*.

Advertising is available for non-members at the nominal fee of £75 + VAT. For further information or to list your vacancies, please contact [admin@soils.org.uk](mailto:admin@soils.org.uk).



# Dates for your Diary

The following 2022 dates are subject to change and will be confirmed within the regular member newsletters. Please pencil these in your diary for now and keep an eye out for any changes!

**20 July**  
BSSS Grant Workshop for Early Career Professionals

**23 July**  
WCSS22 Regular Registration Deadline

**26 July**  
Soil Judging Competition – Welcome to International Teams

**27 - 28 July**  
Soil Judging Competition & Soil Training Days

**29 - 30 July**  
Soil Judging Competition

**31 July**  
World Congress of Soil Science 2022 including Welcome Reception, Glasgow

**31 July**  
Board Meeting

**1 August**  
World Congress of Soil Science 2022 including Early Career Networking Event, Glasgow

**1 August**  
Council Meeting

**2 August**  
World Congress of Soil Science 2022 including AGM, Glasgow

**3 August**  
World Congress of Soil Science 2022 including Gala Dinner, Glasgow

**4 August**  
World Congress of Soil Science 2022 including Closing Ceremony, Glasgow

**5 August**  
One-day and Post-congress Tours

**1 September**  
Fellowship nominations open

**14 - 15 September**  
Contamination & Geotech Exp0

**29 September**  
Science Council Conference: Climate Change

Details of all events listed can be found at:

[www.soils.org.uk/events](http://www.soils.org.uk/events)

If you would like to advertise an event on our website, please email details to [admin@soils.org.uk](mailto:admin@soils.org.uk)

**5 October**  
Zoom Into Soil (online)

**19 October**  
Board Meeting

**2 November**  
Zoom Into Soil (online)

**22 - 24 November**  
Agricultural Land Classification Course (online)

**24 November**  
Council Meeting

**6 December**  
Agricultural Land Classification Course Follow-Up (online)

**7 December**  
Zoom Into Soil (online)

## New Members

Welcome to our newest members who have joined us between November 2021 and May 2022!

### Full

Nastasia Baudin  
Zuzana Feketeová  
Christopher Humphrey  
Karen Johnson  
Pullipalayam Kandasamy Karthikeyan  
Fangbai Li  
Chantal Milner  
Paul Nathanail  
Rodica Pena  
Shiveshwar Pratap Singh  
Kate Smith  
Amin Soltangheise  
Stephen Telford  
Sylvia Toet  
Nicholas Willenbrock

### Technical

Tommy Farr  
Christian Murray  
Neil McCosh  
Paul McCullough  
Helen Porter  
Carl Rowley  
Vincent Sin  
Charlotte White

### Associate

Keshav Adhikari  
Asa Dant  
Steve Ellis  
Kevin Frediani  
Dhammika Hewage  
Anne Noble  
Kumari Rajapaksha

### Early Career

Anna Abramova	Gaurav Gorakh Shelar	Jake Richards
Tadesse Gashaw Asrat	Martine Graf	Martyn Roberts
Aslihan Benlioglu	Kristy Holder	Mahsa Sanaei
Laura Bentley	Elizabeth Johnson	Mamunur Sarker
Louise Bizzarri	Joseph Jones	Emilee Severe
Ella Bradfield	Sam Keenor	Trishla Shaktan
Catherine Chapman	Fatima Khan	Vanessa Silva Melo
Hayley Craig	Munisath Khandoker	Nelida Silvero
Katerina Dauksta	John Langley	Gafaru Sumaila
Emlyn Davies	Anindya Majhi	Cesca Summers
Jennifer Davies	Jajati Mandal	Fanni Tanka
Nine Douwes Dekker	Sarah Mullally	Benjamin Tatton
Francis Durnin-Vermette	Katherine McCool	Megan Tresise
Katie Fairclough	John Nunns	Hannah Walling
Tasmin Fletcher	Kennedy Nyangoni	Lucy Weidner
Luke Fountain	Bethany O'Sullivan	Manikyala Bhargava
Elise Gallois	Mohammad Robel	Narasimha Yadav
Sarah Gilliland	Hossen Patwary	Ubaida Yousaf
	Ana B. Prada Barrio	Han Zheng

## About us

*Promoting the study and profession of soil science*

### Contact us

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### What we do

The British Society of Soil Science (BSSS) was founded in 1947 and is an established international membership organisation and charity committed to the study of soil in its widest aspects. The society brings together those working within academia, practitioners implementing soil science in industry and all those working with, or with an interest in soils.

Research on soils and enhanced understanding and engagement with soils is essential for agricultural, landscaping, construction, remediation, conservation and archaeological projects, as well as policy direction on critical topics such as climate change.

We promote research and education, both academically and in practice, and build collaborative partnerships to help safeguard our soil for the future. This includes hosting the World Congress of Soil Science 2022 in Glasgow, where those with an interest in soil science can meet to discuss the critical global issues relating to soil.

Anyone with an interest in soil is welcome to become a member. Membership starts from £35 for Associate members, with Full membership, which allows the member to use the designation *M I Soil Sci*, for £60 per annum.

To find out more visit the BSSS website:

[www.soils.org.uk](http://www.soils.org.uk)

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