

## Soil Quality Indicator Evaluation Framework

Soil quality indicators (SQIs) reflect the soils' ability to function (e.g. allow infiltration of rainwater) and deliver ecosystem services (e.g. flood control) and public goods (e.g. clean water). Changes in an SQI should reflect a change in that particular function and the flow of goods and services provided by the soil.

The SSA and its science panel have been working on a Soil Quality Indicator Evaluation Framework to assess which biological, physical and chemical soil properties can be used to indicate a soil's ability to deliver the ecosystem goods and services the Environmental Land Management scheme (ELM) will pay for. Based on the work of previous Defra funded projects looking at SQIs and work done as part of the Soil Biology & Soil Health Scorecard, we established that there was no need to repeat the exercise of establishing a universal, core set of Soil Quality Indicators and we could use the outcomes of these projects as a basis for our work.

The project was devised as the necessary next step to address outstanding obstacles towards the widespread application and interpretation of SQIs, specifically:

- **Communication:** to foster a more widespread understanding and consensus of key soil health terminology.
- **Public Goods and Services:** to understand the relevance of particular SQIs for demonstrating how soil delivers different public goods (as opposed to crop or herbage production)
- **Application:** to understand the relevance of particular SQI's in demonstrating changes in soil health/quality as a result of changing land use and management.

We are in the process of developing a 'logical sieve' to establish the value of physical, biological, and chemical soil properties that reflect a soils' ability to function and deliver ecosystem goods and services. We hosted an online workshop in October 2020 with our science panel to present this work to the DEFRA soils team, for further feedback on applicability and to be able to review and amend the sieve based on suggested changes to its structure and criteria. The aim is to:

- Optimise the number of available metrics; striking a balance between the huge variations in soil types and their uses, and the need for a simple set of metrics acceptable to practitioners, policy-makers (Environmental Land Management Scheme), and researcher audiences.
- Use existing categories of land use and public goods, already formalised in policy documents and other relevant land management manuals in the sieve (not reinventing the wheel).
- Provide a starting point for linking nationwide soil monitoring and on-farm soil monitoring by providing a recommended and standardised set of SQIs that could be used by farmers and land managers.