ISRIC
World Soil Information

ISRIC 2030

Strategy 2026-2029

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Foreword

Soil provides a wide range of key functions that support a healthy, resilient natural environment and human well-being. From climate change mitigation and adaptation to food security, biodiversity, urbanisation, and water regulation, healthy soils are recognised as a foundation for sustainable development.

Over the past decade, particularly since the adoption of the 2015 Paris Agreement, the critical role of soils in addressing pressing environmental challenges has become increasingly evident. This growing awareness reinforces the relevance of ISRIC's work in the years ahead.

For over 60 years, ISRIC has been dedicated to developing and applying soil information and knowledge for the benefit of society. As the World Data Centre for Soils, data stewardship, soil information and its accessibility are at the very core of our work. Over the next four years (2026-2029), we will continue strengthening our role as a trusted global reference centre for soil data, information, and standards.

This strategy is the result of a collaborative process within ISRIC. It was developed through close dialogue, collaboration and inclusive feedback between the Director, the management team, and all staff across the organisation. The strategy was thereafter reviewed and approved by ISRIC's board to ensure our vision is aligned with ISRIC's mandate. This collective effort has helped shape a clear and shared direction for the strategic period ahead.

A central priority for ISRIC will be the documentation of our soil collections, including monoliths, soil samples, books, reports, maps, and data. By applying today's best practices and standards for information management, we aim to ensure that these unique collections are more visible, accessible, and usable for researchers and stakeholders worldwide. Preserving this legacy while unlocking its full scientific and societal value and potential is a key responsibility of ISRIC.

At the same time, we will step up our contribution to the development and adoption of international standards for soil information, ensuring the interoperability and harmonisation of soil data. In close collaboration with partners, ISRIC will continue to play an active role in shaping how soils are described (i.e., the standardisation of ontologies and vocabularies for soil data), and how data is shared and served.

Our global soil data products will be improved and expanded. Beyond basic soil properties, we will provide additional information on layers describing soil quality and functions, making our products more relevant and actionable for sustainable soil management, policy development, and land management decisions.

Robust national soil information systems are a prerequisite for sustainable soil resource management, and together with our partners, we must scale up efforts in this area. Therefore, a core focus of our strategy is cooperation and capacity strengthening with national soil information institutes. We believe these institutions are best positioned to develop impactful, country-specific soil information products that support sustainable soil management. ISRIC will support them by providing standards, tools, methodologies, and learning resources.

Finally, we will deepen our engagement with potential users of soil information to jointly develop approaches for using soil data in decision-making.

Looking forward, ISRIC's actions will be guided by this strategy, and we will continue to serve the user community by transforming soil data into accessible and actionable knowledge.

Rik van den Bosch
Director of ISRIC

Context analysis

Soil provides food, clean water and habitats for biodiversity while contributing to climate change adaptation and mitigation. It preserves our cultural heritage and supports our landscapes, and good soil quality is fundamental to achieving the United Nations (UN) Sustainable Development Goals (SDGs). But soil is a fragile resource, takes thousands of years to form, and therefore needs to be carefully managed and safeguarded for future generations.

Today, soils are under threat due to population increase, demand for land for urban development, land degradation such as soil erosion, biodiversity destruction, and climate change – all factors that put pressure on soil health and the livelihoods of millions of people around the world.

About a third of all soils are moderately to highly degraded, resulting in reduced fertility, increased erosion, and diminished water retention. The decline in soil health harms ecosystems, accelerates climate change, and threatens human livelihoods and food security.

The Earth system is a complex, dynamic, and interconnected network of physical, chemical, and biological processes that constantly interact with each other. Understanding these interactions is crucial for comprehending how the Earth functions as a whole and how human activities impact the planet. To accurately run models that describe and simulate Earth system processes, the scientific community requires harmonised, quality-assessed global soil information.

A recent review on the status of the world's soils states that best management practices to limit or mitigate threats to soil health are available, and many of them mitigate multiple soil threats. While these measures are known, understanding soil is important to determine where in the landscape these practices are best implemented. This underlines the need for soil information to make informed decisions on how to manage land sustainably.

The challenge

We see a historical shift in the consideration of soils, from being seen simply as a food provider to being recognised as the provider of a wide range of key functions for human development and well-being. International donors have increased their investments in soils and soil information, and national efforts have acknowledged the importance of soil through policy-level initiatives. However, challenges in the soil community remain concerning data and information on soils, which are often outdated, fragmented, inaccessible, and not comparable.

Standards for developing and storing soil information are lacking or still in development, but not always ready and available through user-friendly tools.

Concerted efforts are needed to collate, standardise, harmonise and serve the available information to the international community, using consistent approaches. Additionally, new soil information needs to be collated to characterise the status of the soils of the world.

Secondly, there is a **need to develop new soil information and knowledge**. In a few countries and regions with a longer history of soil characterisation, soil information systems are available to users. Many other countries do have a history in soil characterisation with soil surveys carried out, but the resulting information is outdated, only available in books and reports and on local computers. Soil information is not readily available for users and requires further development.

Vision, mission and our identity

Vision

At ISRIC, our vision is a world where reliable and relevant soil data, information and knowledge is freely available and properly used to address global environmental and societal challenges.

Mission

Our mission is to increase the availability and use of quality assessed soil data, information and knowledge to (i) contribute to the understanding of the earth system, and (ii) enable better decision-making for sustainable land management around the world.

Together with our partners we produce, gather, compile and serve quality-assessed soil information at global, national and local levels. We stimulate the proper use of this information in cooperation with users and clients. At the global level, we contribute to a better understanding of the earth's systems by providing input data for hydrologic, agronomic, ecological and climate models. At the national and local level, we contribute to improved decision-making in sustainably intensifying food production, climate change adaptation and mitigation, and biodiversity conservation.

Who we are

ISRIC is an independent foundation under Dutch law. We are based on the campus of Wageningen University and Research (WUR).

ISRIC is a science-based organisation and our articles of association state that the purpose of the foundation of ISRIC is to: (i) serve as a global documentation, reference and information centre on soils; (ii) develop knowledge on soils to improve its sustainable use; (iii) develop and make available information on soils globally; (iv) support soil scientists from low and middle income countries to develop soil information systems and national information and reference centres; and (v) contribute to the development of standards for developing and serving of soil information. Therefore, ISRIC is a service provider to the international community dealing with natural resource management.

ISRIC is a regular member of the **World Data System (WDS)** and accredited as the World Data Centre for Soils (WDC-Soils) since 1989, and is certified as a CoreTrustSeal (CTS) trustworthy data repository. The WDS is an interdisciplinary body that promotes access to quality-assessed scientific data, data services, products, and information across a range of disciplines in the natural and social sciences and the humanities. As the WDC-Soils, ISRIC is the focal point for soil-related collections and information services for stakeholders, while as the CoreTrustSeal recipient, ISRIC is internationally recognised as a trustworthy source for soil data repositories and soil data standards.

At ISRIC, we underline the importance of sharing data according to the FAIR principles (Findable, Accessible, Interoperable, and Reusable). Additionally, all the intellectual property (such as data, source code, publications, etc.) generated by ISRIC is open and freely available.

As an international reference and documentation centre, ISRIC maintains the **World Soil Reference Collection**, a resource comprising over 1,100 soil monoliths from 82 countries worldwide. The World Soil Reference Collection is exhibited in the **World Soil Museum**, which informs, inspires, and educates about the nature and diversity of soils worldwide and their implications for society and science.

Our ambition for 2026 – 2029

By 2030, ISRIC will provide added value to the various users of soil data in the following focus areas:

1. Continue our role as international reference, information and data centre on soils, based on ISRIC's soil collections, the World Soil Museum, and our accreditation as World Data Centre for Soils.
2. Develop standards for soil information development and serving with the international community.
3. Together with the international soil science community, develop new, innovative methods for soil mapping and characterisation, and use these methods to produce improved and 'fit-for-intended-use' soil information products.
4. Use our knowledge, expertise and experience to strengthen capacity in countries and work with partners to develop soil information and soil knowledge from national to continental level.
5. Develop data to support decision-making in sustainable land management (SLM) (e.g., information layers for land suitability, soil water availability, acidity and liming, salinity, soil fertility, and soil health) and contribute to further improvements of decision support tools and services.

In all these areas, we will set targets and measurable objectives, which we will report on annually.

Strategic focus

ISRIC's work is subdivided into five focus areas.

Focus area 1: Soil collections and education

For 2026-2029, ISRIC will continue to strengthen its role as an international soil reference information and data centre on soils, by further enhancing soil data and information services, and the impact and reach of the World Soil Museum.

The **World Soil Reference Collection** is a resource comprising over 1,100 soil monoliths from 82 countries worldwide and provides an international standard for the study of soils and their properties. By 2030, ISRIC will considerably contribute to strategically improving and unlocking the current World Soil Reference Collection.

The **World Soil Library** consists of books, reports, grey literature and legacy soil maps, and is an important source of information. It secures access to resources that are otherwise inaccessible. By 2030, ISRIC will ensure that all physical materials in the library are digitised, globally accessible and well managed.

The **World Soil Museum** is the stage for the World Soil Reference Collection. It promotes the appreciation for and understanding of the nature and diversity of soils, and engages people on the topic of soils, their functions, and their importance for society and the environment, both in the museum and online. The museum is an educational hub for researchers, students, and policymakers to learn about soil classification, management, and sustainability. Through guided tours and resources, it highlights the vital role of soils in ecosystems, agriculture, and climate regulation. By 2030, ISRIC will continue to boost the museum's engagement through enhanced digital infrastructure and physical facilities in the museum, improved digital presence (website, mobile app, audio tour), youth targeting, and events.

Focus area 2: Development of standards for soil information development and provisioning

During 2026-2029, ISRIC will develop standards for soil information development and serving, together with the international community.

Specifically, this focus area will work on developing and maintaining standards for soil information development, such as data collection, soil analyses and mapping, data management and sharing. Focus will be on standardising ontologies and vocabularies for soil data and on further developing the World Reference Base for Soil Resources (WRB).

Soil vocabularies and ontologies, in essence, define, determine, and facilitate all phases of the soil data life cycle so that soil data is understandable and reusable by users. The identification (or development) and application of appropriate vocabularies along with an ontology, is therefore one of the very first steps in any soil data process. By 2030, ISRIC will consolidate an international community and contribute to the co-development of global standards for soil vocabularies and ontologies.

The **World Reference Base for Soil Resources (WRB)** is an international system for the classification of soils in the world. WRB is based on the Legend of the Soil Map of the World and emerged from an initiative of the Food and Agriculture Organization of the United Nations (FAO) and the United Nations Educational, Scientific and Cultural Organization (UNESCO), supported by the United Nations Environmental Programme (UNEP) and the International Union of Soil Sciences (IUSS). ISRIC has played a pivotal role in the development of this system, which is currently coordinated by the IUSS Working Group WRB. ISRIC's World Soil Reference Collection is based on the WRB and is a useful resource for WRB development and validation. Towards 2030, ISRIC will continue to contribute to the IUSS Working Group WRB by facilitating a FAIR and standardised WRB data structure. This will allow and improve the use of WRB in different applications.

Focus area 3: Development of harmonised global and continental soil information products

During 2026-2029, ISRIC will develop new, innovative methods for soil mapping and characterisation, and use these methods to produce improved and 'fit-for-intended-use' soil information products, together with the international soil science community.

To this end, ISRIC will further develop and maintain its two global soil information systems (WoSIS – World Soil Information Service and SoilGrids) by standardising and harmonising shared global soil data (WoSIS) and improving and expanding gridded soil information (SoilGrids). SoilGrids and WoSIS follow FAIR data sharing principles and provide targeted information products for specific global users.

WoSIS and SoilGrids will benefit from the latest developments in soil data collection, processing, storage and serving, implementing relevant developments in Geographic Information science, geospatial statistical modelling, remote sensing, and computer science. At ISRIC, innovation in soil information development has always been an important focus. In 2026-2029, ISRIC will focus on further developing innovations in digital soil mapping to achieve higher accuracy, better predictions of spatial patterns, including fitness for use, assess uncertainty, and methods for mapping complex properties.

WoSIS provides a growing range of quality-assessed and standardised soil profile data for the world, used for a wide range of environmental applications. WoSIS draws on voluntary contributions from numerous data providers for the benefit of the international community. During 2026-2029, WoSIS will advance its global database to allow third parties to easily share, standardise, and store their data to improve public global and regional soil information products for the benefit of the global science community. ISRIC will standardise a wider range of soil properties, increasing the possibilities of use of WoSIS data. User-friendly dashboards will be generated with summaries of information, along with other technical advantages, to make the system more user-friendly.

SoilGrids is a system for global digital soil mapping that uses global soil profile information and covariate data to model the spatial distribution of soil properties across the globe. It contains a collection of soil property maps for the world produced using machine learning at 250 meters resolution. Predictions are made at six standard depths according to international standards. SoilGrids prediction models use soil profile observations from WoSIS and globally available environmental covariates, resulting in globally consistent predictions. By 2030, innovations developed for digital soil mapping will be applied to SoilGrids. ISRIC will improve the accuracy and spatial representation of existing layers, and include additional global layers, including soil depth and various complex soil properties (soil organic carbon stocks, available water capacity, land degradation indicators, micronutrients and soluble salts, etc). Also, layers with a lower resolution of 1 km and 5 km will be produced for specific use-cases in the field of global environmental and earth modelling.

Focus area 4: Strengthening Soil Information Systems on national, regional, and continental level

During 2026-2029, ISRIC will further use its knowledge, expertise and experience in soil information provisioning to strengthen capacity in low and middle income countries and work with partners to develop soil information and soil knowledge at the national, regional and continental level. These efforts are currently focused on Africa, with the intent to be expanded to other geographies in the Global South.

ISRIC supports the development of robust soil information systems (SIS), by providing sound tools (Soil Information Resource Library), training (ISRIC Academy), and networking and knowledge sharing (Community of Practice for Soil Information Providers) - all strengthening SIS development from national to continental scales.

At the continental level, the **Community of Practice (CoP) for Soil Information Providers in Africa** provides a platform for professionals and researchers to exchange insights, discuss challenges, and contribute to the collective understanding of soil. ISRIC will continue to grow the thriving community, and support soil practitioners with the knowledge and tools to drive meaningful progress in soil data development. The CoP fosters collaboration, knowledge sharing, and capacity strengthening among experts and institutions dedicated to improving soil data across the continent. By 2030, the CoP's efforts will concentrate on (i) increasing awareness of the importance of standardised and harmonised data, (ii) building trust and a sustainable network, and (iii) stimulating peer-to-peer learning.

Tools and resources that support SIS development

Soil information providers and users can utilise several tools and resources to develop SIS. By 2030, ISRIC is committed to growing and enriching its Resource Library and Academy for global soil information providers and users.

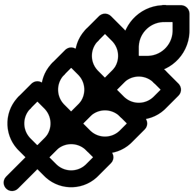
The **Soil Information Resource Library** is an online platform, which provides open-access tools and materials covering all the steps of the Soil Information Workflow (Figure 1).

Figure 1. Soil Information Workflow

The library supports users with practical, hands-on tools to collect, organise, create, and disseminate quality-assessed soil data. By 2030, ISRIC aims to equip stakeholders with robust, user-friendly tools to facilitate fieldwork and to effectively generate standardised soil information to support decision-making at multiple levels. An example of an essential tool is the SIS Framework, which assists in the design and development of a context-specific SIS that addresses local needs and considers the environment in which it operates. Another example is the Seedling tool, a scalable, collaborative digital soil mapping workflow that guides users from raw soil data to usable soil maps in a structured, reproducible, and user-friendly way, without requiring advanced coding skills, thereby broadening access to digital soil mapping to a wider range of users.

The **ISRIC Academy** platform offers structured training courses, developed by ISRIC or partners. During 2026-2029, ISRIC will coordinate the development of audience-focussed modules and work towards a complete set of training modules covering the entire soil information workflow.

Focus area 5: Information products and services to assist decision-making for sustainable land management



ISRIC aims to actively stimulate and showcase the use of soil information in decision-making for sustainable land management (SLM). Decision support services range from maps that support decision-making at the regional level, to operational software that allow land managers to receive site-specific advice on how to manage their land, soil, and crops. These services typically use mechanistic modelling, stochastic approaches, and Artificial Intelligence (AI). With the introduction of AI-based decision support services, the need for accurate and fit-for-purpose soil information that feeds into these AI-based services, has become critical.

By 2030, ISRIC will focus on the development of spatial information products that support the adequate management and use of specific soils and can be used by (AI-based) decision support services. The information products developed combine information on soil, crops, landscape, and climate, and are generated through modelling approaches to support soil fertility management, soil and water conservation, and land suitability assessment. Examples of these products are soil fertility maps for a specific crop, soil nutrient supply maps, maps showing salt-affected soil, maps showing soil acidity informing soil liming, and land suitability maps. ISRIC will work closely with developers of decision support tools, who are anticipated users of these maps.

Further, ISRIC will contribute to the formulation of soil health indicators and use these in the development of spatial soil health information products. Soil and water conservation activities relate to soil erosion and land degradation monitoring and will focus on the land degradation neutrality framework of the United Nations Convention to Combat Desertification (UNCCD).

Methods and tools developed and used to produce the mentioned soil functional information products will be available through the ISRIC Resource Library.

Additional focus

Scientific research and innovation to support methodology development

Our scientific research program contributes to the development of new and innovative methodologies for generating soil data and information products. For this program, we have the following ambitions:

- Continue special professorship in ‘Pedometrics and Digital Soil Mapping’ at Wageningen University, to stimulate further research and collaboration with Wageningen University.
- Provide substantial contributions to international working groups and commissions.
- Ensure active participation in relevant international scientific conferences.
- Continuously have PhD candidates working on methodological innovations on the following topics: soil data quality, digital soil mapping and application of soil information in sustainable land management.
- Annually publish peer-reviewed articles in high-quality scientific.

Spatial Data Infrastructure

To deliver soil data and soil information products, ISRIC maintains the ISRIC Spatial Data Infrastructure (SDI). ISRIC's SDI serves and provides access to: (i) global harmonised information products (focus area 3), (ii) World Soil Reference Collection and World Soil Museum (focus area 1), (iii) past data and information products, (iv) information products developed to support SLM decision-making (focus area 5), and (v) information products from third parties.

Across the strategic period, ISRIC will continue to work with an array of technologies and experts to ensure the maximum impact of its focus areas. ISRIC will focus on generic cloud unaware deployments, free and open source software, SDI needs, specialised software development (front-end, CMS, mobile apps, design), and working with dedicated service providers.

Partnerships and collaborations

ISRIC believes that greater impact can be achieved through collaboration and partnerships. ISRIC's partnerships and collaborations at global, regional and national level are fundamental to its role as World Data Centre for Soils. ISRIC will actively engage in partnerships, networks, and initiatives that advance sustainable land use, climate resilience, water conservation, and food security, by developing and providing soil information and knowledge to support these activities. Through these collaborations, ISRIC will promote open data and soil information standards, and ensure that soil information remains accurate, relevant, and accessible worldwide.

Looking ahead, ISRIC will work in solidarity with stakeholders to drive sustainable and innovative transformation in soil information and knowledge. We will continue to invest in existing partnerships and actively pursue new collaborations with governments, non-governmental organisations, development partners, research institutes, the private sector, and funders.

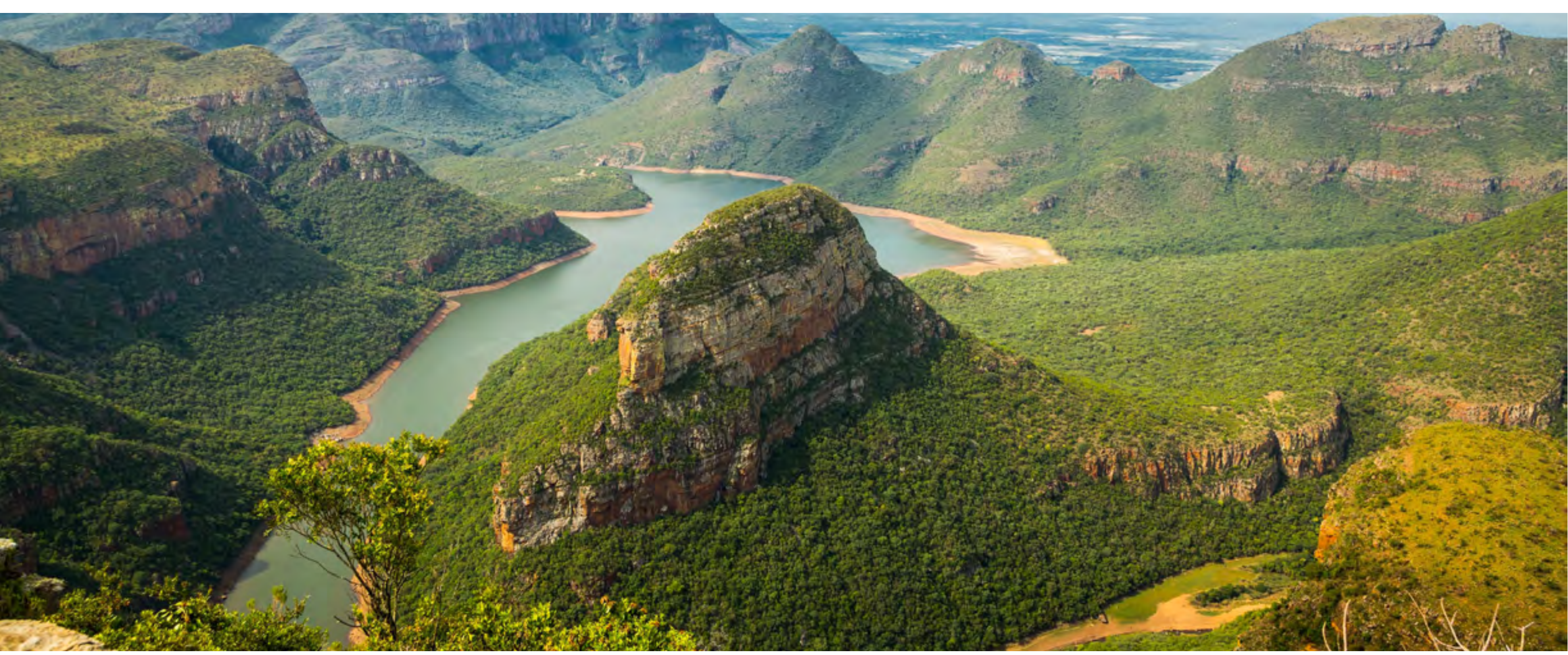
People and organisation

ISRIC is committed to developing a workplace where motivated professionals work efficiently, with pleasure, and have opportunities for both professional and personal development. Integrity, transparency and respect underpin our organisational culture and guide how we work together and deliver our projects.

ISRIC is committed to being an inclusive organisation, with equal opportunities for all, irrespective of race, gender, ability, faith, ideology, sexual orientation, or age and where people feel respected, safe and connected.

Our success by 2030

1. Completely document and unlock ISRICs soil and data collection through an improved online environment by completing the digitisation of all legacy maps and grey literature in the ISRIC World Soil Library.
2. Ensure ISRIC's accreditation as the World Data Centre for Soils, and with the CoreTrustSeal certification.
3. Enhance user experience both on-site and online in the World Soil Museum.
4. Engage and develop standards for vocabularies and ontologies with partners.
5. Continue as key contributors to the development of the IUSS World Reference Base (WRB), the standard for soil classification.
6. Support the generation and use of new soil data, by developing tools to facilitate soil sampling and measurement and by ingesting new data sets in WoSIS.
7. Develop innovations in digital soil mapping for global soil information to include higher accuracy, better quantified spatial uncertainty, fit-for-intended-purpose and new complex soil properties.
8. Further strengthen the international community of soil information provisioners and provide tools for the development of soil information (systems) at the national level, including online learning tools.
9. Develop soil information products, services, methods, and tools to support decision-making in SLM (soil fertility management, soil erosion, and land suitability assessment), together with partners.
10. Contribute to scientific developments through peer-reviewed publications, conference presentations, and PhD-research.
11. Improve and advance ISRIC's Spatial Data Infrastructure.
12. Work in solidarity with international partners and stakeholders, driving sustainable and innovative transformation in soil information and knowledge.
13. Foster a healthy and vibrant workplace at ISRIC.



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