Assessment Information

[CoreTrustSeal Requirements 2017–2019](#)

Repository:	ISRIC WDC - Soils
Website:	https://www.isric.online/about/world-data-centre-soils-wdc-soils
Certification Date:	24 July 2018

This repository is owned by: **ISRIC - World Soil Information**

Core Trustworthy Data Repository Requirements

BACKGROUND INFORMATION

Context

R0. Please provide context for your repository.

Repository Type.

Domain or subject-based repository

Institutional repository

Publication repository

Library/Museum/Archives

Other (please describe)

Comments

Brief Description of the Repository's Designated Community.

ISRIC – World Soil Information, legally registered as the International Soil Reference and Information Centre (ISRIC), has a mission to serve the international community as custodian of global soil information. Since 1989, ISRIC WDC - Soils is a service provider to the international science communities, policy communities and the private sector dealing with issues including food production, land and water management, climate change, environmental quality, social justice, land-use planning, and biodiversity. We do this by providing quality-assessed soil data and interpreted soil information. We maintain a deep understanding of soil assessment, soil analysis and soil data handling. ISRIC is a science-based organisation, meaning that the approaches and methods we use to build our products are based on sound science. We participate in scientific research in the field of soil measurement, soil mapping, pedometrics and soil/information standards, aiming to generate knowledge that we use to innovate our methods.

Level of Curation Performed.

C. Enhanced curation – e.g. conversion to new formats; enhancement of documentation,

D. Data-level curation – as in C above; but with additional editing of deposited data for accuracy

Comments

Outsource Partners. If applicable, please list them.

ISRIC has a service level agreement with Wageningen University, formalising operational support (http://www.wur.nl/en/wageningen-university.htm).

We also have an agreement with Wageningen UR for maintaining and serving the on-line "ISRIC World Soil Library and Map Collection" (http://www.isric.org/explore/library).

Other Relevant Information.

ISRIC is registered as a trusted research data repository by re3data.org (http://doi.org/10.17616/R3X01J).

On 20 June 2017, ISRIC has been elected to host the Soil Data Facility (SDF) of the Global Soil Partnership (GSP) following an open call (http://www.fao.org/global-soil-partnership/resources/highlights/detail/en/c/1026182/). The GSP was established in December 2012. Its mandate is to improve governance of the limited soil resources of the planet in order to guarantee agriculturally productive soils for a food secure world, as well as support other essential ecosystem services; this, in accordance with the sovereign right of each State over its natural resources. In order to achieve its mandate, the GSP addresses five pillars of action to be implemented in collaboration with its regional soil partnerships (http://www.fao.org/global-soil-partnership/en/); ISRIC mainly contributes to Pillar 4 (Information and data) and Pillar 5 (Harmonization), as well as capacity building.

Providing information on the soils of the world is an enormous task and a continuing challenge for a compact organisation such as ISRIC. We can only properly fulfil our mission in collaboration with partners in our field (http://www.isric.org/utilise/collaboration).

Our products and datasets are widely used and cited by the international community, as evidenced by numerous citations in peer-reviewed articles and other media; see, for example, http://www.isric.org/about/staff-publications.

Key developments at ISRIC WDC - Soils are regularly reported to and announced on the ICSU-WDS website (https://www.icsu-wds.org/news/announcements). This to inform the wider WDS community of our activities and milestones.

Follow up on comments by ICSU-WDS on "WDS Biennial Report Form (15/05/2015)":

1) Since May 2017, we have a fully revised website (http://isric.org) and an updated soil data hub (GeoNetwork 3.0 metadata catalogue; http://data.isric.org) that provides 24/7 access to our steadily growing collection of quality-assessed databases and maps; this, in accord with the terms of the (actualised) ISRIC Data and Software Policy (http://www.isric.org/about/data-policy; June 2016). Our GeoNetwork is being harvested a.o. by the ICSU-WDS portal and GEOSS portal (from end October 2017) and soon by NASA-GCMD.

2) Significant attention has been paid to the long-term preservation of our physical collections; this in conjunction with the opening of the new World Soil Museum on the Wageningen Campus in 2014 (http://www.isric.org/explore/world-soil-museum). Since July 2016, you may take a virtual tour of the museum and collections (http://wsm.isric.org/). An actualised collection plan (https://tinyurl.com/y8slw9d4) will be made available at the end of 2018 when the SoLEX soil sampling project ends (http://isric.org/projects/soil-exploration-and-sampling-science-and-education-solex).

3) Workflows for ingesting and processing soil data in our databases are now better described at http://www.isric.org/explore/wosis; these consider defined procedures and standards (http://isric.org/about/standards; see also sections below).

Reviewer Entry

Accept or send back to applicant for modification:
Accept

Comments:

ORGANIZATIONAL INFRASTRUCTURE

I. Mission/Scope

Compliance Level: 4

R1. The repository has an explicit mission to provide access to and preserve data in its domain.

ISRIC was founded in 1966. The origin of the International Soil Museum (ISM, now ISRIC) lies with the International Society of Soil Sciences (ISSS). At its 7th Congress in 1960, the foundation of an "International Soil Museum" was recommended in a resolution that also called for the compilation of a "Soil Map of the World". The need for such a Museum was emphasized through a new resolution at the next ISSS Congress in 1964, which mentioned that its programme should link up with the FAO-Unesco-ISSS "Soil-Map-of-the-World-Project" as started in 1961. Subsequently, during the 1964 Congress, Unesco agreed to include the soil museum idea in its (then) Programme of Earth Sciences. An offer from the (then) Netherlands Ministry of Education and Science to house it in the Netherlands was accepted by the General Conference of Unesco in 1964. Since that time, the scope of our "soil mission" has gradually broadened. Nowadays, we are a service provider to the international science communities, policy communities and the private sector dealing with issues including food production, land and water management, climate change, environmental quality, social justice, land-use planning, and biodiversity. We do this by providing quality-assessed soil data and interpreted soil information. We maintain a deep understanding of soil assessment, soil analysis and soil data handling. ISRIC is a science-based organisation, meaning that the approaches and methods we use to build our products are based on sound science. We participate in scientific research in the field of soil measurement, soil mapping, pedometrics and soil information standards, aiming to generate knowledge which we use to innovate our methods (see: https://www.isric.online/sites/default/files/isric_highlights_2016_2017.pdf).

Reviewer Entry

Accept or send back to applicant for modification:
Accept

Comments:

II. Licenses

Compliance Level: 4

R2. The repository maintains all applicable licenses covering data access and use and monitors compliance.

Licence-related information supplied with datasets submitted for consideration in the ISRIC Data Repository are managed in our institutional server database (WoSIS, World Soil Information Service; see http://www.isric.org/explore/wosis) and later processed using a standardised workflow (https://www.isric.online/explore/soil-information-brokering). The original licence determines which data may be standardised/shared and for which specific purposes. These conditions are enforced in WoSIS, a PostgreSQL server database. Datasets with a CC BY or CC BY-NC Creative Commons licence (or similar) will be standardised using the regular WoSIS workflow prior to their distribution (with the original licence). Alternatively, some data(sets) may only be used to make derivative predictions and visualisations, such as SoilGrids (http://www.isric.org/explore/soilgrids). Such derivative products are made available with an open data licence in accordance with the ISRIC Data Policy (http://www.isric.org/about/data-policy). In so far as possible for a small centre (19 FTE), we monitor data usage, citation and compliance to the conditions of the ISRIC Data and Software Policy. When non-adherence is observed, we kindly request the concerned parties to resolve the situation, as indicated in the ISRIC Data Policy.

Reviewer Entry

Accept or send back to applicant for modification:
Accept

Comments:

III. Continuity of access

Compliance Level: 3

R3. The repository has a continuity plan to ensure ongoing access to and preservation of its holdings.

ISRIC celebrated its 50th Anniversary in 2016; unless major unforeseen conditions arise, we will continue with our mission to provide ongoing access to our data holdings and ensure their long-term preservation. These plans are embedded in ISRIC's rolling 2–3 year plans and long-term strategy (5 yr and 10 yr). The ISRIC board and management are striving to find a mechanism to better secure its data activities by: a) finding alternative sources of funding to support WDC - Soils, and b) identifying options for transferring the holdings to another ICSU-WDS facility or other suitable host organization if, for any unforeseen reason, ISRIC would be unable to sustain its long- term commitment made to ICSU-WDC (since 1989). Once identified, this will be formulated in a continuity plan.

Reviewer Entry

Accept or send back to applicant for modification:
Accept

Comments:
It is expected by the time of its next certification that ISRIC WDC - Soils has developed and published a continuity plan.

IV. Confidentiality/Ethics

Compliance Level: 3

R4. The repository ensures, to the extent possible, that data are created, curated, accessed, and used in compliance with disciplinary and ethical norms.

Data created, curated and distributed by ISRIC WDC - Soils are subject to the terms of the ISRIC Data and Software Policy (http://isric.org/about/data-policy); 'raw' source data are screened/processed in accordance to these terms using a well-defined workflow (https://www.isric.online/explore/soil-information-brokering). As indicated, conditions for use and citation as defined by the data providers are enforced in our institutional server database (i.e., managed in WoSIS).

Note: ISRIC WDC-Soils is dealing with physical geosciences, hence ethics are not explicitly stated in our Data Policy. However, we are in the process of incorporating such in our website in line with the "Rules for the protection of personal data inside and outside the EU" (https://ec.europa.eu/info/law/law-topic/data-protection); see https://www.isric.online/cookies).

Reviewer Entry

Accept or send back to applicant for modification:
Accept

Comments:

V. Organizational infrastructure

Compliance Level: 4

R5. The repository has adequate funding and sufficient numbers of qualified staff managed through a clear system of governance to effectively carry out the mission.

ISRIC - World Soil Information is a foundation with a global mandate, funded by the Netherlands Government, and with a strategic association with Wageningen UR. The foundation has a Board of Governors and an International Scientific Advisory Council (ISAC). ISAC members help set out the overall strategy for ISRIC and provide advice about and actively support actions to implement the ISRIC strategy. Specific areas for recommendations include international institutional strategy, science policy and funding strategy with 3-, 5- and 10-year goals, and support for fundraising opportunities (http://www.isric.org/about/people; see tab: ISAC). ISRIC staff (total FTE 19) are presently comprised of a director, deputy director, scientists (senior, medior and junior), a business developer (acquisition), and key "support" staff for collection, database, website management and overall administration (http://www.isric.org/about/people; see tab: Staff). Out of these, about 2–3 FTE are regularly involved with ISRIC's WDC - Soils related tasks. Two new staff members (mainly IT and web services experts) strengthened our ranks in November 2017. In addition to the above, a varying number of guest researchers (visiting scientists) carry out targeted-research at our Centre for periods ranging from two up to 12 months. Typically, such guest research should result in a peer-reviewed paper, project proposal(s) for future collaboration, or new applications/web-services (http://www.isric.org/about/isric-guest-researcher-programme). ISRIC staff also supervise PhD and MSc students, mainly from Wageningen UR. Five ISRIC scientists are members of the "C.T. de Wit Graduate School for Production Ecology and Resource Conservation" (PE&RC). PE&RC is a collaborative research and PhD training institution coordinated by Wageningen University (http://www.isric.org/utilise/capacity-building/theses). Several of our scientific staff are editors, associate-editors and/or members of editorial boards of scientific journals, verified peer-reviewers, and/or members of scientific advisory boards (as detailed on the respective staff pages and summarised at: https://www.isric.online/sites/default/files/isric_highlights_2016_2017.pdf#page=18. In June 2017, by special appointment, the Executive Board of Wageningen University appointed one of our senior scientists as professor in "Pedometrics and Digital Soil Mapping", thus opening novel opportunities for PhD research at ISRIC.

Professional staff development (e.g., advanced courses, training) forms an integral part of ISRIC's annual staff performance assessment. ISRIC staff participated in and presented at a wide range of science meetings and conferences, including:

- Global Soil Organic Carbon Symposium (FAO, Rome, 21–23 March 2017)

- FAO-UNCCD Joint Workshop on Collaboration to Support Delivery of SDG 15.3 (FAO/UNCCD, Rome, 25–26 May 2017)
- WOCAT Symposium & 18th Int'l Network Meeting and Steering Committee meeting (WOCAT / CIAT / FAO, Cali (Colombia), 12–18 June 2017)
- GlobalSoilMap 2017 Conference (Dokuchaev SSI, RUDN, IUSS-WG GSM, Moscow, Russia 3–6 July, 2017)
- Open Land Data workshop (ISRIC / USDA, Wageningen 2–4 July 2017)
- UNCCD COP13 and iSQAPER Plenary meeting (UNCCD, CAAS, Ordos & Beijing, China, 8–15 Sept 2017)
- OGC TC (OGC, Palmerston North, New Zealand, 5–8 December 2017)
- LandPKS Global Partners Workshop (USDA / USAID, Las Cruces NM & Boulder CO, 4–11 March 2016)
- EEA Land Degradation Expert meeting (European Environmental Agency, Copenhagen, Denmark 1–2 March 2016)
- SciDataCon2016 (ICSU-WDS, ICSU-CODATA, IDW, Denver, Colorado (USA), 11–14 Sept. 2016)
- BoNAres workshop 'Standards' (BoNares, Berlin, Germany, 12–13 October 2016)
- EUROSOIL 2016 (European Confederation of Soil Science Societies, Istanbul, Turkey, 16–18 October 2016)
- 5th International Soil Classification Congress (Commission 1.4 IUSS, Pretoria, Bloemfontein, South Africa, 1–7 December 2016)
- UNCCD Scientific Conference (UNCCD, Cancun, Mexico 9–12 March 2015)
- EGU General Assembly 2015 (EGU, Vienna, Austria, 13–17 April 2015)
- Geospatial World Forum INSPIRE conference (EU, Lisbon, Portugal, 25–29 May 2015)
- 3rd Global Soil Week (Institute for Advanced Sustainability Studies (IASS), Berlin, Germany, 19–23 April 2015)
- CFCC 2015 – Our common feature under climate change (ICSU, Future Earth, UNESCO and major French research institutions, with the support of the French Government, Paris, France, 6–10 July 2015)
- Representing soil carbon dynamics in global land models to improve future IPCC assessments (RCN FORECAST, Breckenridge (CO, USA), 12–14 June 2014)
- FOSS4G-EUROPA Conference (Jacob University, Bremen, Germany, 15–17 July 2014)
- SciDataCon2014 (ICSU-WDS & CODATA, Delhi, India, 2–5 November 2014)
- 1st Global Soil Biodiversity Conference (Global Soil Biodiversity Initiative (GSBI), Dijon, France, 2–5 December 2014)

[See also https://www.isric.online/sites/default/files/isric_highlights_2014-2015.pdf and https://www.isric.online/sites/default/files/isric_highlights_2016_2017.pdf]

Reviewer Entry

Accept or send back to applicant for modification:

Accept

Comments:

VI. Expert guidance

Compliance Level: 4

R6. The repository adopts mechanism(s) to secure ongoing expert guidance and feedback (either in-house, or external, including scientific guidance, if relevant).

As indicated (R5), we have an international advisory board (ISAC) to help set out the overall strategy for ISRIC and provide advice about and actively support actions to implement the ISRIC strategy. We maintain and develop our scientific and technical expertise through active participation in various international fora and working groups (see: http://www.isric.org/utilise/collaboration), and by regularly attending international conferences and workshops (see R5).

We aim to adhere to the FAIR principles; our data should be 'Findable, Accessible, Interoperable, and Reusable' (http://www.isric.org/sites/default/files/isric_report_2017_01doi.pdf). In this context, in 2017, ISRIC WDC - Soils was considered in an external evaluation of data repository adherence to the FAIR principles (http://dx.doi.org/10.4121/uuid:5146dd06-98e4-426c-9ae5-dc8fa65c549f), fulfilling most of the criteria. Since then, we have implemented a new GeoNetwork 3.0 catalogue (http://data.isric.org). We adhere to international standards for research data repositories as reflected in re3data.org metrics (http://doi.org/10.17616/R3X01J). Our metadata are handled in an OGC-compliant metadata GeoNetwork 3.0 catalogue; datasets are managed in our central PostgreSQL database (WoSIS).

As indicated, ISRIC has a mission to "serve the international community with information about the world's soil resources to help addressing major global issues." This process involves all stages of the data lifecycle, from data sampling in the field and laboratory analyses to collation into quality-assessed databases followed by data standardisation (and where feasible harmonisation), analysis, modelling, and publication of the data and derived products. With partners, we are working towards the maintenance and development of new, internationally recognised standards for handling and exchange of soil data. For example, in partnership with GODAN and others, we are working towards an XML procedure for interoperable exchange of soil data within the context of a federated database structure (see: http://www.godan.info/working-groups/soil-data).

Our scientific guidance includes capacity building at the ISRIC premises in Wageningen as well as tailor-made trainings abroad. Through these activities, we serve the international community with a wide array of courses and lectures on the topic of soils and state-of-the-art digital soil mapping; as such, the annual Spring School is a major event in our capacity building work (http://www.isric.org/utilise/capacity-building/springschool).

Providing quality-assessed and interoperable information on the soils of the world is an enormous task and a continuing challenge for a compact organisation such as ISRIC. Therefore, as indicated (R0), we can only properly fulfil our mission in collaboration with a wide range of partners from various disciplines (http://www.isric.org/utilise/collaboration).

Reviewer Entry

Accept or send back to applicant for modification:

Accept

Comments:

DIGITAL OBJECT MANAGEMENT

VII. Data integrity and authenticity

Compliance Level: 4

R7. The repository guarantees the integrity and authenticity of the data.

We maintain and operate a GeoNetwork 3.0 metadata catalogue, and manage point data in a relational server database (PostgreSQL). Referential integrity checks and versioning are inbuilt in the process; lineage is checked and documented to the extent possible (note: data providers are not necessarily the creator(s) of the data themselves, so some information is seldom provided). As indicated earlier, our procedures are according to defined international standards and (newly emerging) de facto soil science standards (http://www.isric.org/about/standards). Maintaining data integrity and authenticity is considered the responsibility of everyone within ISRIC; the overall procedure is overseen by the ISRIC Editorial Board. Guiding principles for this, and other in-house procedures, are described in an internal handbook (not freely available).

Main procedures and standards in use at ISRIC - World Soil Information are described in a technical report (https://www.isric.online/sites/default/files/isric_report_2017_01doi.pdf). These cover the whole data lifecycle, from field sampling to serving quality-assessed soil data to the world community. Consistent procedures and de facto standards are used to screen (QA/QC) and standardise, respectively; harmonising the wide range of soil-related data that have been shared with us for consideration in our world-covering databases and web services. Ultimately, these processes are aimed at facilitating global data interoperability and citeability in compliance with the FAIR principles: the data should be "findable, accessible, interoperable, and reusable."

Reviewer Entry

Accept or send back to applicant for modification:
Accept

Comments:

VIII. Appraisal

Compliance Level: 4

R8. The repository accepts data and metadata based on defined criteria to ensure relevance and understandability for data users.

ISRIC welcomes the following materials for inclusion in its physical collections or digital data holdings:

- Analogue soil data collections, including soil studies and soil survey reports and maps, in either scanned or paper format (http://www.isric.org/explore/library).
- Digital soil data collections, including metadata, which may include soil profile datasets as well as gridded or polygon-based soil maps.

Upon their standardisation, harmonisation and inclusion into the global collection, selected data will be made freely accessible to the international community in compliance with the data license specified by each data provider (http://www.isric.org/explore/wosis). Soil data collections may be shared (i.e., submitted) by email either as an attachment or, for large datasets, by providing URL/FTP access; extra formats (e.g., web forms) for this are being developed. In all cases, we recommend data providers contact us before submitting data in order to discuss technical details, and possible data/metadata quality issues (http://www.isric.org/explore/share).

Our collection development policy for soil data is mainly focussed on filling existing soil geographic and taxonomic gaps to arrive gradually at a representative global coverage for use in digital soil mapping and other applications (see https://doi.org/10.5194/essd-9-1-2017). To a large extent, this activity is determined by the willingness, and ability, of soil data providers to share (some) of the data they hold with the WDC - Soils for the greater benefit of the international community. It is anticipated that such data exchange processes will be facilitated by the Global Soil Partnership, which has a global, UN-endorsed mandate for this. As of September 2017, we are the Soil Data Facility for the GSP. Quality control standards and preferred formats are described in a technical report (https://www.isric.online/sites/default/files/isric_report_2017_01doi.pdf).

Reviewer Entry

Accept or send back to applicant for modification:
Accept

Comments:

IX. Documented storage procedures

Compliance Level: 4

R9. The repository applies documented processes and procedures in managing archival storage of the data.

The overall approach for checking, generating and serving open soil data at ISRIC is according to the WoSIS/SoilGrids workflow (https://www.isric.online/explore/soil-information-brokering), and the processing is registered in our central database. Main principles of data storage, quality control, standardisation/harmonisation, and data processing as implemented at ISRIC WDC - Soils for digital data, have been published in various open access papers, most recently in *Earth Syst. Sci. Data* **9**, 1-14 (http://dx.doi.org/10.5194/essd-9-1-2017) and *PLOS ONE* **12**, e0169748 ([http://dx.doi.org/10.1371%2Fjournal.pone.0169748)](http://dx.doi.org/10.1371%2Fjournal.pone.0169748). For the library holdings (reports and paper maps; also scanned versions thereof), we follow the procedures implemented by Dutch University Libraries, in casu Wageningen UR: http://www.isric.org/explore/library. All materials are allocated a unique identifier (called ISN); more recently also DOIs. Preferred and acceptable formats for generating and submitting data are in line with those recommended by WDS, DANS (2015), and OGC. We recommend the use of standard templates for submitting (small) datasets (http://www.isric.org/contribute-data-wosis-effort). Concerning point data, all source data are converted "as is" (i.e., original data model and naming conventions) into PostgreSQL prior to their mapping to the WoSIS data model. All our databases are subject to regular backups on multiple servers, with implemented security measures (classified), thus ensuring our continual services to the international community. In case of severe "system failure", we should be back online within 24 to 48 hours.

Reviewer Entry

Accept or send back to applicant for modification:
Accept

Comments:

X. Preservation plan

Compliance Level: 3

R10. The repository assumes responsibility for long-term preservation and manages this function in a planned and documented way.

Since 1966, ISRIC has ensured the long-term preservation of its physical collections and later (from the 1990s) digital collections in consistence with its mission and rolling long-term strategy. Permissions to store, copy, and transform digital items are regulated in the licences, or letters of agreement, between the respective data providers and ISRIC WDC - Soils. Specific terms for this are outlined in the ISRIC Data Policy (http://www.isric.org/about/data-policy). We aim to serve all our holdings in an open source and open access format (to ensure continuity), next to preserving digital material in their source format. For our physical collections, we have an emerging collection management plan that outlines the long-term strategy (https://preview.tinyurl.com/y8slw9d4); the actual preservation planning will be finalised upon completion of the "Soil Exploration and Sampling for Science and Education (SOLEX)" project in 2018.

Reviewer Entry

Accept or send back to applicant for modification:
Accept

Comments:
The current preservation plan is not explicit and will benefit from documentation. It is expected that this will be in place for ISRIC WDC - Soils' next certification.

XI. Data quality

Compliance Level: 3

R11. The repository has appropriate expertise to address technical data and metadata quality and ensures that sufficient information is available for end users to make quality-related evaluations.

Soil data are collected all over the world using different standards for sampling, analysing and processing the data. Information on the actual quality of the source data is seldom provided, so this generally has to be inferred from the metadata provided. This subjective rating then provides a measure to data users for the possible confidence they may have in the standardised/harmonised data provided by our institute. This enables the user community to make sound decisions about the suitability of the various data for a specific use (e.g., regional or global application). Typically, such information on "suitability-for-use" is discussed in the peer-reviewed papers that accompany main releases of our datasets. Metadata for our digital holdings are managed in a GeoNetwork 3.0 instance that implements the ISO 19115 standard, defining metadata sections, entities and elements. The metadata catalogue enforces schema checks before uploading; schematron evaluation is according to ISO 19115(19139).

We aim to be INSPIRE compliant, in so far as compatible with our worldwide mission. GeoNetwork provides a Catalogue Web Service (CWS), which is an important part of a Spatial Data Infrastructure (SDI) and a requirement for the Global Earth Observations System of Systems (GEOSS) and interoperability with the ICSU-WDS portal. All output is subjected to a technical and content screening by the "Product quality control" team, prior to distribution via web services or external peer-review.

Reviewer Entry

Accept or send back to applicant for modification:
Accept

Comments:
Data quality practices are adequate, but metadata evaluation is needed in addition to schema. It is expected that this will be in place for ISRIC WDC - Soils' next certification.

XII. Workflows

Compliance Level: 4

R12. Archiving takes place according to defined workflows from ingest to dissemination.

As indicated, the overall workflow from ingestion to dissemination is described in the WoSIS/SoilGrids workflow (https://www.isric.online/explore/soil-information-brokering). This includes clear discussion with potential data providers as regards the formats and types of data they should submit, how they may define how their data should be handled/processed/distributed, the quality checks involved, as well as selection criteria for inclusion (e.g., checks on uniqueness of profiles, as similar profiles may have been described in different database using different identifiers; completeness of metadata), decision handling within the workflow subject to the defined licence specified by each data provider, and actual data processing. Details are provided in a Procedures Manual (https://www.isric.online/sites/default/files/isric_report_2018_01.pdf); earlier, a compact description of the workflow has been published in the Earth System Science Data Journal (https://doi.org/10.5194/essd-9-1-2017).

Reviewer Entry

Accept or send back to applicant for modification:
Accept

Comments:

XIII. Data discovery and identification

Compliance Level: 4

R13. The repository enables users to discover the data and refer to them in a persistent way through proper citation.

As indicated, for datasets this is regulated through a GeoNetwork 3.0 catalogue, with searchable metadata and direct access to the corresponding datasets (and licence). The metadata can be harvested—as is the case, for example, with the ICSU-WDS portal and GEOSS portal—facilitating discovery and accessibility to our shared data holdings. The ISRIC repository offers persistent identifiers: UUIDs (universally unique identifiers) such as generated for profiles in WoSIS and metadata described in GeoNetwork. These UUIDs allow for easy profile identification in diverse computer systems like harvesting environment, web services, broadcasting in social networks (e.g., Twitter and Facebook), and integration with GeoNetwork. For our library holdings, we use the unique and persistent identifiers (ISN) allocated by the Wageningen University Library (with which we have a service level agreement). ISRIC WDC - Soils own DOIs, for publications and published (static) datasets, are allocated via DataCite. In 2018, upon arrival of our new IT/web experts (see R5), we will implement an automated facility for uploading new datasets with their metadata, and implement procedures to allocate DOIs to such sets provided they pass our initial, basic quality/consistency checks.

Reviewer Entry

Accept or send back to applicant for modification:
Accept

Comments:

XIV. Data reuse

Compliance Level: 4

R14. The repository enables reuse of the data over time, ensuring that appropriate metadata are available to support the understanding and use of the data.

Metadata in our GeoNetwork 3.0 instance are provided according to ISO 19115 standards, defining metadata sections, entities and elements. These metadata can be easily harvested by our user community. We use open source software for all our web applications, as increasingly used by our user community. In case of major updates to a given dataset or visualisation, a new "snapshot" will be generated with its own DOI and detailed information on changes and data lineage (and typically a peer-reviewed paper for citation). Older proprietary formats, such MsAccess databases, are being converted to open source alternatives; this is seen as an ongoing process.

Reviewer Entry

Accept or send back to applicant for modification:
Accept

Comments:

TECHNOLOGY

XV. Technical infrastructure

Compliance Level: 4

R15. The repository functions on well-supported operating systems and other core infrastructural software and is using hardware and software technologies appropriate to the services it provides to its Designated Community.

Our web services are aimed at maximising service availability, data interoperability and continuity. Our spatial data infrastructure (SDI)—for a simplified representation, see https://www.isric.online/explore/soil-information-brokering—is mainly based on Free and Open Source Software such as Linux, PHP, LaTeX, R and contributed R packages, RStudio, GDAL, GRASS, SAGA GIS, QGIS, PostgreSQL, Geoserver, PostGIS, Python, Google Earth and similar. This makes our products independent of commercial software packages. Mechanisms have been developed for users in "low bandwidth" areas to download part of the desired data; for example, using our SoilInfo App mobile phone application (http://www.isric.org/explore/soilinfo). In recognition of our expertise in the field, as indicated (see R0), ISRIC has recently been selected to host the Soil Data Facility (SDF) for the Global Soil Partnership (GSP) (http://www.fao.org/global-soil-partnership/resources/highlights/detail/en/c/1026182/).

Reviewer Entry

Accept or send back to applicant for modification:
Accept

Comments:

XVI. Security

Compliance Level: 4

R16. The technical infrastructure of the repository provides for protection of the facility and its data, products, services, and users.

We have a service level agreement with Wageningen University (terms not publicly available), which ensures the security of our web services and makes regular backups of our holdings on multiple servers. We have a similar agreement with a large international webhosting company (STRATO; terms of agreement not publicly available) for our GeoNetwork-related holdings. Should a system unexpectedly crash, a recent version can be reinstalled and become operational within 24–48 hours. In such cases, only the latest changes to the corresponding systems (maximum 1 day) will have to be re-implemented.

Reviewer Entry

Accept or send back to applicant for modification:
Accept

Comments:
The service level agreements with the University and webhosting company should be confirmed for the record. If they cannot be shared, then a public summary should be made available by the time of ISRIC WDC - Soils' next certification.

APPLICANT FEEDBACK

Comments/feedback

It would be nice to have "boxes" where URLs to resources/webpages can be entered. Preferably, multiple entries should be allowed. It would be nice if the filled-in forms could be printed as PDF for archiving. There have been several "bugs" during saves/submits.

Reviewer Entry

Accept or send back to applicant for modification:
Accept

Comments: