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# WoSIS: standardised soil profile data for digital soil mapping at global scale

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ISRIC has developed a centralized enterprise database known as WoSIS (World Soil Information Service) to safeguard and share soil data upon their standardization and harmonization. Data have been shared by a growing number of partners and data providers, whose contributions we gratefully acknowledge. Over 30 datasets from all around the globe have been ingested, corresponding with some 400 thousand geo-referenced soil profiles and 40 million observations (i.e. site and layer/horizon data) in total.

So far, the following soil properties have been standardized: bulk density, calcium carbonate equivalent, organic carbon, total nitrogen, cation exchange capacity, effective cation exchange capacity, electrical conductivity, amount of coarse fragments, content of sand, silt and clay-size particles, soil pH, available phosphorus content and water retention with additional information on soil analytical methods provided. The data, representing some 150 thousand profiles worldwide, are served freely via WFSi through our Spatial Data Infrastructure (SDI).

SDI's are platforms prepared to facilitate distribution of data and their metadata in a simple and effective way. With SDI's, it is easier to organize metadata following ISO (International Organization for Standardization) and INSPIRE standards, visualize data, download and transform data formats on the fly. The SDI structure implemented at ISRIC is described and different ways of accessing data are illustrated.

Our SDI is based on open source technologies and open web-services (WFS, WMS, WCS, CSW) defined by Open Geospatial Consortium (OGC) and aimed specifically at soil data. It has three major components: PostgreSql+PostGIS, GeoServer and GeoNetwork. Visualization and data download are done in GeoNetwork with resources from GeoServer; with these two systems data visualization, metadata and access are addressed. The third component is the PostgreSQL database, with the spatial extension PostGIS, in which WoSIS resides; the database is connected to GeoServer to allow data download from GeoNetwork. These processes are aimed at facilitating global data interoperability and citeability in compliance with FAIR principles that is the data should be 'findable, accessible, interoperable, and reusable'.

Standardized soil data served from WoSIS can be used to underpin digital soil mapping, such as SoilGrids, and to address a wide range of global issues.