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Ecological soil functions — Characteristics, indicators and methods

Fonctions écologiques du sol — Caractéristiques, indicateurs et méthodes

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Foreword

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This document was prepared by Technical Committee ISO/TC 190, *Soil quality*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

In recent years, the concern for soil sustainability has considerably increased. Many countries are setting targets to reduce soil artificialisation and reinforce ecosystem rehabilitation and biodiversity conservation. In Europe, the recent proposal for a directive on soil monitoring and resilience will set foundations for member states to consider.

In this context, concepts of soil health and soil quality are being discussed[86][97][98] and ecological soil functions are being proposed[87][90]. However, although several promising propositions have been made to define lists of indicators of soil health and soil quality in different contexts (e.g. Reference [94]), there is presently no consensus.

Based on the definitions of soil health and soil quality presented in ISO/TS 18718, this document aims to provide an overview of the existing indicators and characteristics that are linked to soil functions and the available methods to assess them whether they are internationally standardized, nationally standardized or exist as peer-reviewed work.

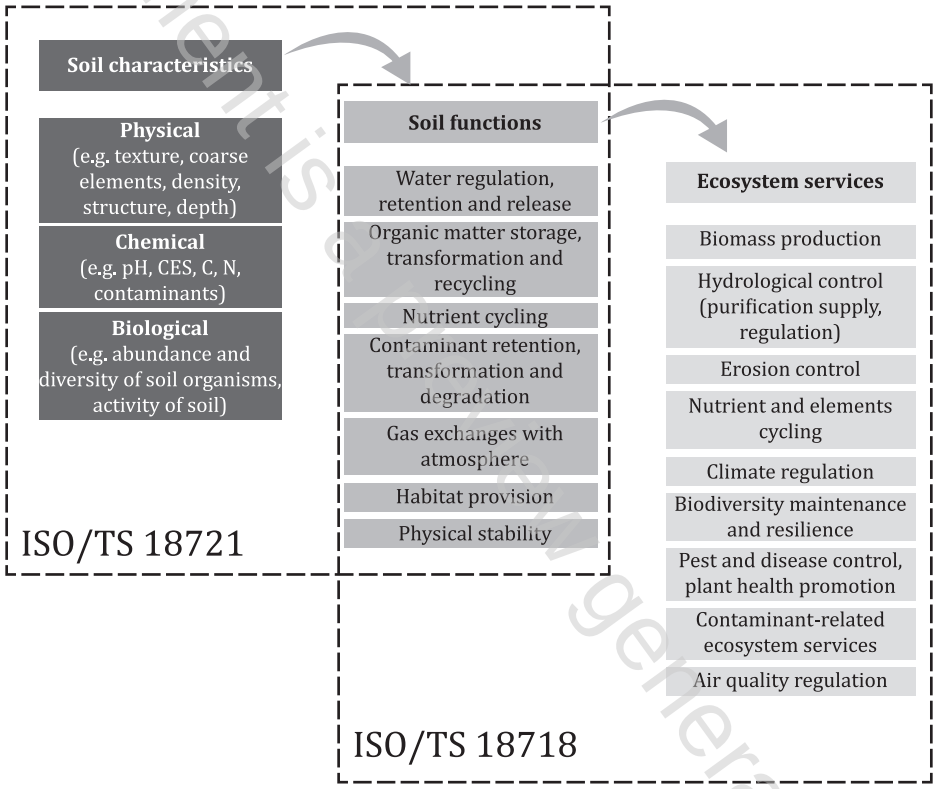

Figure 1 — Links between ISO/TS 18718 and this document (ISO/TS 18721) on the soil functions and related ecosystem services

Ecological soil functions — Characteristics, indicators and methods

1 Scope

This document provides a generic description of the methods available for measuring soil characteristics and indicators of core ecological soil functions. No distinction of context is made, i.e. no differentiation of land use and management (e.g agricultural, forest, urban, natural or contaminated lands). For each ecological soil function, the document specifically lists biotic and abiotic characteristics that can be measured. It focuses on characteristics and indicators that are either available as ISO documents or published in peer-reviewed papers.

This document applies to ecological soil functions and is not applied to soil functions such as geotechnical functions (foundation support for buildings, tunnels, etc.) or geothermal functions. Indeed, ecosystem services do not address soils without a topsoil, or with a covered topsoil (buildings, infrastructure, greenhouse farming, solar panel parks).

Methods and indicators for ecological soil functions can help in the assessment of soil-related ecosystem services but the overall assessment of ecosystem services is not covered in this document.

Other methods based on proxy indicators (e.g. soil occupation, hydrography parameters) can also be used for land planning at large scale. These indicators are not included in this document.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 11074, *Soil quality — Vocabulary*

ISO/TS 18718, *Soil functions and related ecosystem services — Definitions, descriptions and conceptual framework*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 11074 and ISO/TS 18718 apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

4 Indicators of ecological soil functions

4.1 General

Soil functions are one or a combination of soil processes that drive the dynamics of the ecosystem structure or composition (see Table 1). Each function can be divided into different sub-functions (see Table 1). Soil processes are the interactions among physical, chemical and biological soil components underlying soil functions.