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STN P	**Geografické informácie Klasifikačné systémy Časť 3: Meta jazyk na opis systémov o využívaní krajiny (LUML) (ISO/TS 19144-3: 2024)**	**STN P CEN ISO/TS 19144-3 01 9356**

Geographic information - Classification systems - Part 3: Land Use Meta Language (LUML) (ISO/TS 19144-3:2024)

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 01/25

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English Version

Geographic information - Classification systems - Part 3: Land Use Meta Language (LUML) (ISO/TS 19144-3:2024)

Information géographique - Systèmes de classification - Partie 3: Métalangage d'affectation des sols (LUML) (ISO/TS 19144-3:2024)

Geoinformationen - Klassifizierungssysteme - Teil 3: Land Use Meta Language (LUML) (ISO/TS 19144-3:2024)

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Contents

Page

European foreword

This document (CEN ISO/TS 19144-3:2024) has been prepared by Technical Committee ISO/TC 211 "Geographic information/Geomatics" in collaboration with Technical Committee CEN/TC 287 “Geographic Information” the secretariat of which is held by BSI.

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Endorsement notice

The text of ISO/TS 19144-3:2024 has been approved by CEN as CEN ISO/TS 19144-3:2024 without any modification.

Technical Specification

ISO/TS 19144-3

Geographic information — Classification systems —

Part 3: Land Use Meta Language (LUML)

Information géographique — Systèmes de classification — Partie 3: Métalangage d'affectation des sols (LUML)

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Contents

Page

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 211, *Geographic information/Geomatics,* in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 287, *Geographic Information,* in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement), and in collaboration with the Food and Agriculture Organization of the United Nations (UN FAO).

A list of all parts in the ISO 19144 series can be found on the ISO website.

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

There is a tremendous diversity in how people establish a built infrastructure on land or over water, or otherwise make use of the surface of the earth. This diversity in use also means that there is a great diversity in how Land Use is described. Land Use data (even more so than Land Cover) are closely linked to national and regional customs, legislation, or economic factors, and are therefore necessarily quite different from one country or region to another. Within one country or region there can also be different Land Use classifications in operation, serving different administrative and management purposes. It is not meaningful to try to standardize this multitude of classifications, but it is meaningful to develop a meta-language that can assist in the comparison of systems, assist translation between the systems and help international and other organizations when they need to extract comparable data from many different data sources.

The aim of this document is to enable the comparison of information from existing classification systems in a meaningful way without replacing them. The aim is to complement the development of future classification systems that can offer more reliable collection methods for particular national or regional purposes by allowing them to be described in a consistent manner.

A critical factor in implementing such global activities is the availability of a common, umbrella Land Use classification system structure. This then provides a reliable basis for interaction without replacing the increasing number of national, regional and global Land Use mapping and monitoring activities. This enables comparisons of Land Use classes to be made regardless of mapping scale, Land Use type, data collection method or geographic location.

This document provides a metalanguage expressed as a UML model that allows different Land Use classification systems to be described. This document establishes a metalanguage for a set of objects and rules (language) to describe Land Use features that can be part of different Land Use legends (nomenclature). This provides a framework for comparing different systems and nomenclatures. This document is not a description of a nomenclature nor is it a description of a specific set of classes.

The design concepts are described as follows.

— A classification process deals with the structuring of a specific knowledge domain in order to create consistency, stability and common understanding in communication between the users, therefore its main function is the capability to be a valid reference system for a larger community of users.

— However, a classification is a dynamic process. Definitions can change over time and in relation to the prevalence of other cultures, evolving user needs and new scientific advances.

— No classification system can fully reflect either the social or the natural world completely accurately.

— There are always multiple ways to conceptualize and communicate knowledge, thus there can be an inherent ambiguity in any categorization.

— The way to create consistency in this complex and dynamic domain is the establishment of a metalanguage that defines the framework of elements and rules with which any user can define their own specific ontology.

— The system needs to be documented through a rigorous definition of a generative grammar explicated using a graphic modelling language (UML class diagram).

The metalanguage needs to ensure migration from “human language” to a “machine representation” of the “elements, rules and conditions” with which a particular category (or set of categories) has been generated.

Additional parts of the ISO 19144 series are defined to describe the classification of other aspects of the environment, such as Land Cover (ISO 19144-2). These other parts appear in separate documents, but may be used in conjunction with classifications systems described using the Land Use Meta-Language specified in this document.

There is a requirement for registration of some characteristics and code lists to be used with the classes in this metalanguage and in any instantiation of this metalanguage. Registration is also desirable for a set of instantiated schemas that correspond to the many existing Land Use classification systems in broad

use. A section on registration existed in the previous edition of ISO 19144-2:2012. This content has now been separated into another part of the series, in order to generalize the registration process, allowing it to support Land Use as well as Land Cover and any other future parts of the ISO 19144 series. In addition, this new part on registration will also address implementation issues.

The present document (ISO/TS 19144-3) is a new part of the ISO 19144 series. Some of the content of this document addressing Land Use was originally contained in ISO 19144-2:2012. The description of these Land Use elements has been moved to this document. In addition, there have been changes to the classes LC_ GrowthFormCharacteristic, LC_CultivatedAndManagedVegetation, and LC_BuiltUpSurfaces to clarify the differences between Land Cover and Land Use. Details relating to backward compatibility are described in Annex C.

There is a need amongst some users of this document for an expression of Land Cover and or Land Use information in XML, as well as a need for an XML Schema (XSD). This document describes a reference metamodel for the description and comparison of classification systems. Any classification system described using this metamodel is not implicitly an ISO standardized classification system. An XML expression of this document is an XML expression of a metamodel and therefore such an XML Schema is a metaschema. An XML expression of Land Cover and/or Land Use information needs to be at the Application Schema level, which is one level of instantiation lower than the metaschema and defined in terms of a particular classification system. The use of metamodels and the subsequent instantiation into models, including the instantiation into an XML Schema that can be used to encode data is an implementation issue that is not addressed in this document.

Appropriate references to externally managed lists or listed items established particularly for the ISO 19144 series can be registered. In addition, whole classification systems described using the Land Cover or Land Use parts of the ISO 19144 series can be registered. The name and contact information of the maintenance agency for this document can be found at www.iso.org/maintenance_agencies.

This document is a joint deliverable with the UN Food and Agriculture Organization (UN FAO). Permission has been granted to ISO by the UN FAO to make a derived work based on any material developed or copyright UN FAO. The EAGLE concept has also provided input to the process of developing this document.[21]

In this document UML attributes names are given in *italics*.

In accordance with the ISO/IEC Directives, Part 2, 2018, Rules for the structure and drafting of International Standards, in International Standards the decimal sign is a comma on the line. However, the General Conference on Weights and Measures (Conférence Générale des Poids et Mesures) at its meeting in 2003 passed unanimously the following resolution:

“The decimal marker shall be either a point on the line or a comma on the line.”

In practice, the choice between these alternatives depends on customary use in the language concerned. In the technical areas of geodesy and geographic information it is customary for the decimal point always to be used, for all languages. That practice is used throughout this document.

Technical Specification **ISO/TS 19144-3:2024(en)**

Geographic information — Classification systems —

Part 3:
Land Use Meta Language (LUML)

1 Scope

This document specifies a Land Use Meta Language (LUML) expressed as a UML metamodel that allows different Land Use classification systems to be described. This document recognizes that there are a number of Land Use classification systems in existence. It provides a common reference structure for the comparison and integration of data for any generic Land Use classification system, but does not intend to replace those classification systems. This document complements ISO 19144-2 on Land Cover Meta Language (LCML) and can be used independently to describe Land Use or together with ISO 19144-2 to describe a combined Land Cover Land Use.

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 19103, *Geographic information — Conceptual schema language*

ISO 19123-1, *Geographic information — Schema for coverage geometry and functions — Part 1: Fundamentals*

ISO 19144-1, *Geographic information — Classification systems — Part 1: Classification system structure*

ISO 19144-2, *Geographic information — Classification systems — Part 2: Land Cover Meta Language (LCML)*