

SVENSK STANDARD

SS-EN ISO 19123:2007



Fastställt/Approved: 2007-04-12

Publicerad/Published: 2007-05-07

Utgåva/Edition: 1

Språk/Language: engelska/English

ICS: 35.020; 35.240.01; 35.240.30; 35.240.50; 35.240.60; 35.240.70

Geografisk information – Schema för geometri och funktioner för yttäckande representation (ISO 19123:2005)

Geographic information – Schema for coverage geometry and functions (ISO 19123:2005)

This preview is downloaded from www.sis.se. Buy the entire standard via <https://www.sis.se/std-60465>

Standarder får världen att fungera

SIS (Swedish Standards Institute) är en fristående ideell förening med medlemmar från både privat och offentlig sektor. Vi är en del av det europeiska och globala nätverk som utarbetar internationella standarder. Standarder är dokumenterad kunskap utvecklad av framstående aktörer inom industri, näringsliv och samhälle och befrämjar handel över gränser, bidrar till att processer och produkter blir säkrare samt effektiviserar din verksamhet.

Delta och påverka

Som medlem i SIS har du möjlighet att påverka framtida standarder inom ditt område på nationell, europeisk och global nivå. Du får samtidigt tillgång till tidig information om utvecklingen inom din bransch.

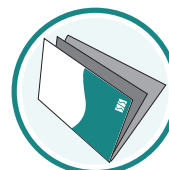
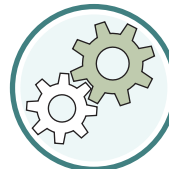
Ta del av det färdiga arbetet

Vi erbjuder våra kunder allt som rör standarder och deras tillämpning. Hos oss kan du köpa alla publikationer du behöver – allt från enskilda standarder, tekniska rapporter och standardpaket till handböcker och onlinetjänster. Genom vår webbtjänst e-nav får du tillgång till ett lättnavigerat bibliotek där alla standarder som är aktuella för ditt företag finns tillgängliga. Standarder och handböcker är källor till kunskap. Vi säljer dem.

Utveckla din kompetens och lyckas bättre i ditt arbete

Hos SIS kan du gå öppna eller företagsinterna utbildningar kring innehåll och tillämpning av standarder. Genom vår närhet till den internationella utvecklingen och ISO får du rätt kunskap i rätt tid, direkt från källan. Med vår kunskap om standarders möjligheter hjälper vi våra kunder att skapa verklig nytta och lönsamhet i sina verksamheter.

Vill du veta mer om SIS eller hur standarder kan effektivisera din verksamhet är du välkommen in på www.sis.se eller ta kontakt med oss på tel 08-555 523 00.



Standards make the world go round

SIS (Swedish Standards Institute) is an independent non-profit organisation with members from both the private and public sectors. We are part of the European and global network that draws up international standards. Standards consist of documented knowledge developed by prominent actors within the industry, business world and society. They promote cross-border trade, they help to make processes and products safer and they streamline your organisation.

Take part and have influence

As a member of SIS you will have the possibility to participate in standardization activities on national, European and global level. The membership in SIS will give you the opportunity to influence future standards and gain access to early stage information about developments within your field.

Get to know the finished work

We offer our customers everything in connection with standards and their application. You can purchase all the publications you need from us - everything from individual standards, technical reports and standard packages through to manuals and online services. Our web service e-nav gives you access to an easy-to-navigate library where all standards that are relevant to your company are available. Standards and manuals are sources of knowledge. We sell them.

Increase understanding and improve perception

With SIS you can undergo either shared or in-house training in the content and application of standards. Thanks to our proximity to international development and ISO you receive the right knowledge at the right time, direct from the source. With our knowledge about the potential of standards, we assist our customers in creating tangible benefit and profitability in their organisations.

If you want to know more about SIS, or how standards can streamline your organisation, please visit www.sis.se or contact us on phone +46 (0)8-555 523 00



Europastandarden EN ISO 19123:2007 gäller som svensk standard. Detta dokument innehåller den officiella engelska versionen av EN ISO 19123:2007.

Denna standard ersätter SS-ISO 19123:2006, utgåva 1.

The European Standard EN ISO 19123:2007 has the status of a Swedish Standard. This document contains the official English version of EN ISO 19123:2007.

This standard supersedes the Swedish Standard SS-ISO 19123:2006, edition 1.

© Copyright/Upphovsrätten till denna produkt tillhör SIS, Swedish Standards Institute, Stockholm, Sverige. Användningen av denna produkt regleras av slutanvändarlicensen som återfinns i denna produkt, se standardens sista sidor.

© Copyright SIS, Swedish Standards Institute, Stockholm, Sweden. All rights reserved. The use of this product is governed by the end-user licence for this product. You will find the licence in the end of this document.

Uppllysningar om sakinnehållet i standarden lämnas av SIS, Swedish Standards Institute, telefon 08-555 520 00. Standarder kan beställas hos SIS Förlag AB som även lämnar allmänna uppllysningar om svensk och utländsk standard.

Information about the content of the standard is available from the Swedish Standards Institute (SIS), telephone +46 8 555 520 00. Standards may be ordered from SIS Förlag AB, who can also provide general information about Swedish and foreign standards.

Standarden är framtagen av kommittén för Ramverk för geodata, SIS/TK 323.

Har du synpunkter på innehållet i den här standarden, vill du delta i ett kommande revideringsarbete eller vara med och ta fram andra standarder inom området? Gå in på www.sis.se - där hittar du mer information.

EUROPEAN STANDARD

EN ISO 19123

NORME EUROPÉENNE

EUROPÄISCHE NORM

March 2007

ICS 35.240.70

English Version

Geographic information - Schema for coverage geometry and functions (ISO 19123:2005)

Information géographique - Schéma de la géométrie et des fonctions de couverture (ISO 19123:2005)

Geoinformation - Coverage Geometrie- und Funktionsschema (ISO 19123:2005)

This European Standard was approved by CEN on 25 February 2007.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: rue de Stassart, 36 B-1050 Brussels

Contents

Page

Foreword.....	v
Introduction	vi
1 Scope	1
2 Conformance	1
3 Normative references	2
4 Terms, definitions, abbreviated terms and notation	2
4.1 Terms and definitions.....	2
4.2 Abbreviated terms	7
4.3 Notation	7
5 Fundamental characteristics of coverages.....	8
5.1 The context for coverages	8
5.2 The coverage schema	9
5.3 CV_Coverage.....	10
5.4 CV_DomainObject.....	13
5.5 CV_AttributeValues	13
5.6 CV_CommonPointRule.....	14
5.7 CV_DiscreteCoverage	14
5.8 CV_GeometryValuePair.....	15
5.9 CV_ContinuousCoverage	16
5.10 CV_ValueObject	17
5.11 CV_InterpolationMethod	18
5.12 Subclasses of CV_ContinuousCoverage	18
6 Discrete coverages	18
6.1 Discrete coverage types	18
6.2 CV_DiscretePointCoverage	19
6.3 CV_PointValuePair.....	20
6.4 CV_DiscreteGridPointCoverage	20
6.5 CV_GridPointValuePair	21
6.6 CV_DiscreteCurveCoverage	21
6.7 CV_CurveValuePair	22
6.8 CV_DiscreteSurfaceCoverage	22
6.9 CV_SurfaceValuePair	24
6.10 CV_DiscreteSolidCoverage	24
6.11 CV_SolidValuePair.....	24
7 Thiessen polygon coverage	25
7.1 Thiessen polygon networks	25
7.2 CV_ThiessenPolygonCoverage.....	25
7.3 CV_ThiessenValuePolygon	27
8 Quadrilateral grid coverages	27
8.1 General.....	27
8.2 Quadrilateral grid geometry.....	27
8.3 CV_Grid.....	30
8.4 CV_GridEnvelope.....	31
8.5 CV_GridPoint.....	31
8.6 CV_GridCoordinate.....	32
8.7 CV_GridCell	32
8.8 CV_Footprint	33
8.9 CV_RectifiedGrid	33

8.10	CV_ReferenceableGrid	34
8.11	CV_ContinuousQuadrilateralGridCoverage	35
8.12	CV_GridValueCell.....	36
8.13	CV_GridPointValuePair	36
8.14	CV_GridValuesMatrix.....	37
8.15	CV_SequenceRule	38
8.16	CV_SequenceType.....	38
9	Hexagonal Grid Coverages	39
9.1	General	39
9.2	CV_HexagonalGridCoverage	39
9.3	CV_GridValuesMatrix.....	41
9.4	CV_ValueHexagon	41
10	Triangulated irregular network (TIN) coverages	41
10.1	General	41
10.2	CV_TINCoverage	43
10.3	CV_ValueTriangle.....	43
11	Segmented curve coverages	44
11.1	General	44
11.2	CV_SegmentedCurveCoverage	45
11.3	CV_ValueCurve	45
11.4	CV_ValueSegment	46
11.5	Evaluation	46
Annex A (normative) Abstract test suite		47
Annex B (informative) UML Notation		51
Annex C (informative) Interpolation methods.....		56
Annex D (informative) Sequential enumeration.....		60
Bibliography		65

Foreword

The text of ISO 19123:2005 has been prepared by Technical Committee ISO/TC 211 "Geographic information/Geomatics" of the International Organization for Standardization (ISO) and has been taken over as EN ISO 19123:2007 by Technical Committee CEN/TC 287 "Geographic Information", the secretariat of which is held by NEN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by September 2007, and conflicting national standards shall be withdrawn at the latest by September 2007.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

Endorsement notice

The text of ISO 19123:2005 has been approved by CEN as EN ISO 19123:2007 without any modifications.

Introduction

Geographic phenomena fall into two broad categories — discrete and continuous. Discrete phenomena are recognizable objects that have relatively well-defined boundaries or spatial extent. Examples include buildings, streams and measurement stations. Continuous phenomena vary over space and have no specific extent. Examples include temperature, soil composition and elevation. A value or description of a continuous phenomenon is only meaningful at a particular position in space (and possibly time). Temperature, for example, takes on specific values only at defined locations, whether measured or interpolated from other locations.

These concepts are not mutually exclusive. In fact, many components of the landscape may be viewed alternatively as discrete or continuous. For example, a stream is a discrete entity, but its flow rate and water quality index vary from one position to another. Similarly, a highway can be thought of as a feature or as a collection of observations measuring accidents or traffic flow, and an agricultural field is both a spatial object and a set of measurements of crop yield through time.

Historically, geographic information has been treated in terms of two fundamental types called vector data and raster data.

“Vector data” deals with discrete phenomena, each of which is conceived of as a feature. The spatial characteristics of a discrete real-world phenomenon are represented by a set of one or more geometric primitives (points, curves, surfaces or solids). Other characteristics of the phenomenon are recorded as feature attributes. Usually, a single feature is associated with a single set of attribute values. ISO 19107:2003 provides a schema for describing features in terms of geometric and topological primitives.

“Raster data”, on the other hand, deals with real-world phenomena that vary continuously over space. It contains a set of values, each associated with one of the elements in a regular array of points or cells. It is usually associated with a method for interpolating values at spatial positions between the points or within the cells. Since this data structure is not the only one that can be used to represent phenomena that vary continuously over space, this International Standard uses the term “coverage,” adopted from the Abstract Specification of the Open GIS Consortium [1], to refer to any data representation that assigns values directly to spatial position. A coverage is a function from a spatial, temporal or spatiotemporal domain to an attribute range. A coverage associates a position within its domain to a record of values of defined data types.

In this International Standard, coverage is a subtype of feature. A coverage is a feature that has multiple values for each attribute type, where each direct position within the geometric representation of the feature has a single value for each attribute type.

Just as the concepts of discrete and continuous phenomena are not mutually exclusive, their representations as discrete features or coverages are not mutually exclusive. The same phenomenon may be represented as either a discrete feature or a coverage. A city may be viewed as a discrete feature that returns a single value for each attribute, such as its name, area and total population. The city feature may also be represented as a coverage that returns values such as population density, land value or air quality index for each position in the city.

A coverage, moreover, can be derived from a collection of discrete features with common attributes, the values of the coverage at each position being the values of the attributes of the feature located at that position. Conversely, a collection of discrete features can be derived from a coverage, each discrete feature being composed of a set of positions associated with specified attribute values.

Geographic information — Schema for coverage geometry and functions

1 Scope

This International Standard defines a conceptual schema for the spatial characteristics of coverages. Coverages support mapping from a spatial, temporal or spatiotemporal domain to feature attribute values where feature attribute types are common to all geographic positions within the domain. A coverage domain consists of a collection of direct positions in a coordinate space that may be defined in terms of up to three spatial dimensions as well as a temporal dimension. Examples of coverages include rasters, triangulated irregular networks, point coverages and polygon coverages. Coverages are the prevailing data structures in a number of application areas, such as remote sensing, meteorology and mapping of bathymetry, elevation, soil and vegetation. This International Standard defines the relationship between the domain of a coverage and an associated attribute range. The characteristics of the spatial domain are defined whereas the characteristics of the attribute range are not part of this standard.

2 Conformance

This International Standard specifies interfaces for several types of coverage objects. In addition, it supports the interchange of coverage data independently of those interfaces. Thus, it specifies two sets of conformance classes: one for implementation of the interfaces, the other for the exchange of coverage data. Each set includes one conformance class for each type of coverage specified in this International Standard (Table 1).

Table 1 — Conformance classes

Conformance class	Subclause
Simple coverage interface	A.1.1
Discrete coverage interface	A.1.2
Thiessen polygon coverage interface	A.1.3
Quadrilateral grid coverage interface	A.1.4
Hexagonal grid coverage interface	A.1.5
TIN coverage interface	A.1.6
Segmented curve coverage interface	A.1.7
Discrete coverage interchange	A.2.1
Thiessen polygon coverage interchange	A.2.2
Quadrilateral grid coverage interchange	A.2.3
Hexagonal grid coverage interchange	A.2.4
TIN coverage interchange	A.2.5
Segmented curve coverage interchange	A.2.6