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## ABSTRACT

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<Insert Abstract Text here>



## KEYWORDS

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The following are keywords to be used by search engines and document catalogues.

keyword\_1, keyword\_2, keyword\_3, etc.



# PREFACE

---

This document establishes the OGC CRS ontology and its submodules. The definition of elements of coordinate reference systems is an essential part of geospatial data provision. However, until now, coordinate reference systems and their components could not be represented in an OGC-standardized semantic web vocabulary. This document introduces the ontology model, its classes and properties, application examples and can serve as the foundation of a semantic web based coordinate system registry at OGC. Special attention is given to the compatibility of the CRS Ontology vocabulary to other OGC-endorsed Semantic Web standards such as GeoSPARQL and alignments to other data standards are provided as part of this specification.

**NOTE:** Insert Preface Text here. Give OGC specific commentary: describe the technical content, reason for document, history of the document and precursors, and plans for future work.

There are two ways to specify the Preface: “simple clause” or “full clause”

If the Preface does not contain subclauses, it is considered a simple preface clause. This one is entered as text after the `.Preface` label and must be placed between the AsciiDoc document attributes and the first AsciiDoc section title. It should not be give a section title of its own.

If the Preface contains subclauses, it needs to be encoded as a full preface clause. This one is recognized as a full Metanorma AsciiDoc section with the title “Preface”, i.e. `== Preface`. (Simple preface content can also be encoded like full preface.)

## IV

### SECURITY CONSIDERATIONS

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No security considerations have been made for this Standard.

## V

### SUBMITTERS

---

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## VI

### SOURCE OF THE CONTENT FOR THIS OGC DOCUMENT

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## VII

### VALIDITY OF CONTENT

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## VIII

### FUTURE WORK

---

**NOTE:** If you need to place any further sections in the preface area use the [ .preface ] attribute.



## CONTRIBUTORS

---

Additional contributors to this Standard include the following:

Individual name(s), Organization



1

# SCOPE

---



# SCOPE

---

<Insert Scope text here>

**NOTE:** Give the subject of the document and the aspects of that scope covered by the document.



2

# CONFORMANCE

---



## 2

## CONFORMANCE

---

<Insert conformance content here>

**NOTE:** Provide a short description of the content approached in subsequent sections and the main subject of the document



3

# 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.

*Identification of Common Molecular Subsequences.* Smith, T.F., Waterman, M.S., J. Mol. Biol. 147, 195–197 (1981)

*ZIB Structure Prediction Pipeline: Composing a Complex Biological Workflow through Web Services.* May, P., Ehrlich, H.C., Steinke, T. In: Nagel, W.E., Walter, W.V., Lehner, W. (eds.) Euro-Par 2006. LNCS, vol. 4128, pp. 1148–1158. Springer, Heidelberg (2006)

*The Grid: Blueprint for a New Computing Infrastructure.*, Foster, I., Kesselman, C.. Morgan Kaufmann, San Francisco (1999).

*Grid Information Services for Distributed Resource Sharing.* Czajkowski, K., Fitzgerald, S., Foster, I., Kesselman, C. In: 10th IEEE International Symposium on High Performance Distributed Computing, pp. 181–184. IEEE Press, New York (2001)



4

# TERMS AND DEFINITIONS

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This document uses the terms defined in OGC Policy Directive 49, which is based on the ISO/IEC Directives, Part 2, Rules for the structure and drafting of International Standards. In particular, the word “shall” (not “must”) is the verb form used to indicate a requirement to be strictly followed to conform to this document and OGC documents do not use the equivalent phrases in the ISO/IEC Directives, Part 2.

This document also uses terms defined in the OGC Standard for Modular specifications (OGC 08-131r3), also known as the ‘ModSpec’. The definitions of terms such as standard, specification, requirement, and conformance test are provided in the ModSpec.

For the purposes of this document, the following additional terms and definitions apply.

## 4.1. example term

---

term used for exemplary purposes

**Note 1 to entry:** An example note.

Example      Here’s an example of an example term.

[SOURCE: ]



5

# CONVENTIONS

---

**NOTE:** This section provides details and examples for any conventions used in the document. Examples of conventions are symbols, abbreviations, use of XML schema, or special notes regarding how to read the document.

## 5.1. Identifiers

---

The normative provisions in this standard are denoted by the URI

<http://www.opengis.net/spec/{standard}/{m.n}>

All requirements and conformance tests that appear in this document are denoted by partial URIs which are relative to this base.

## 5.2. Other conventions

---

<Place any other convention needed with its corresponding title>





6

# CORE

---

This clause establishes the **Core** Requirements class, with IRI /req/core, which has a corresponding Conformance Class, **Core**, with IRI /conf/core.

The Core module establishes a set of classes and properties which define the building blocks of a spatial reference system definition. Some of the definitions are extended in specialized modules related to the Core module.

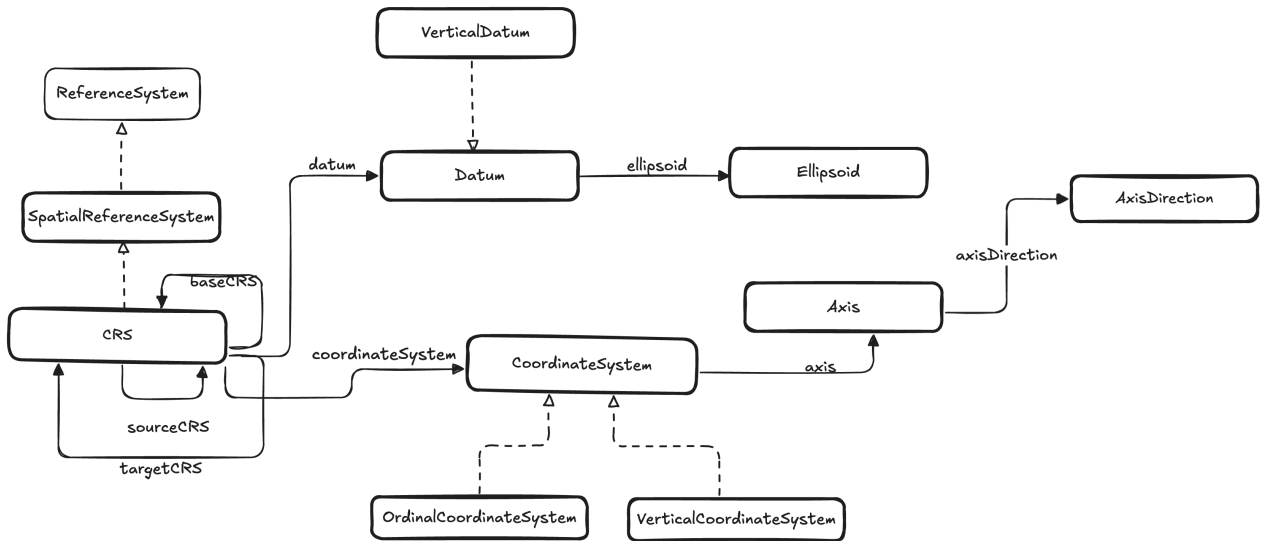


Figure 1

From a base class SpatialReferenceSystem, we define a class for a coordinate system, as the superclass of all spatial reference systems describing locations using coordinates. These SpatialReferenceSystems are described using a Datum and a coordinate system definitions with at least one coordinate axis. Together with several subtypes of coordinate reference system, these definitions complete the Core module.

## REQUIREMENTS CLASS 1: 06-CORE.ADOC EXTENSION

IDENTIFIER	/req/06-core.adoc
TARGET TYPE	Implementation Specification
REQUIREMENT	/req/Coordinate_Reference_System_Parameters
	/req/Coordinate_Reference_System_Types
	/req/Coordinate_Reference_System_Properties

# 6.1. Coordinate Reference System Parameters

Requirement 1: Coordinate Reference System Parameters	
IDENTIFIER	/req/Coordinate_Reference_System_Parameters
STATEMENT	Implementations shall allow the RDFS classes geosrs:AreaOfUse, geosrs:Extent, geosrs:GeographicBoundingBox, geosrs:AxesList, geosrs:SingleCRSList to be used in SPARQL graph patterns.

## 6.1.1. Class: geosrs:AreaOfUse

Table 1 — geosrs:AreaOfUse

URI	<a href="https://w3id.org/geosrs/srs/AreaOfUse">https://w3id.org/geosrs/srs/AreaOfUse</a>
Definition	Area within which a coordinate operation may be used.
Example	<code>geosrs:AreaOfUse</code>

## 6.1.2. Class: geosrs:Extent

Table 2 — geosrs:Extent

URI	<a href="https://w3id.org/geosrs/srs/Extent">https://w3id.org/geosrs/srs/Extent</a>
Definition	Geographic area or time interval in which the referring object is valid. Cf. ISO 19115-1:2014:2014-04, part 6.6.1 and table B.15 line 335.

## 6.1.3. Class: geosrs:GeographicBoundingBox

Table 3 — geosrs:GeographicBoundingBox

URI	<a href="https://w3id.org/geosrs/srs/GeographicBoundingBox">https://w3id.org/geosrs/srs/GeographicBoundingBox</a>
Definition	Frame delimiting an area of interest. See ISO 19115-1:2014:2014-04, part 6.6.1 and table B.15.1 line 344.

### 6.1.4. Class: geosrs:AxesList

Table 4 — geosrs:AxesList

URI	<a href="https://w3id.org/geosrs/srs/AxesList">https://w3id.org/geosrs/srs/AxesList</a>
Definition	Ordered list of coordinate system axes.

### 6.1.5. Class: geosrs:SingleCRSList

Table 5 — geosrs:SingleCRSList

URI	<a href="https://w3id.org/geosrs/srs/SingleCRSList">https://w3id.org/geosrs/srs/SingleCRSList</a>
Definition	Ordered list of simple reference coordinate systems.

## 6.2. Coordinate Reference System Properties

### REQUIREMENT 2: COORDINATE REFERENCE SYSTEM PROPERTIES

IDENTIFIER	/req/Coordinate_Reference_System_Properties
STATEMENT	Implementations shall allow the RDFS properties geosrs:baseCRS, geosrs:conversion, geosrs:coordinateSystem, geosrs:datum, geosrs:datumEnsemble, geosrs:domainOfValidity, geosrs:method, geocrs:asProj4, geocrs:asProjJSON, geocrs:asWKT, geosrs:EPSGcode to be used in SPARQL graph patterns.

### 6.2.1. Property: geosrs:baseCRS

Table 6 — geosrs:baseCRS

URI	<a href="https://w3id.org/geosrs/srs/baseCRS">https://w3id.org/geosrs/srs/baseCRS</a>
Type	<a href="#">owl:ObjectProperty</a>

Definition	The geodetic coordinate reference system on which a projected coordinate reference system is based. Cf. ISO 19111:2007:2007-07, table 11, association role base CRS.
Range	<a href="#"><u>GeodeticCRS</u></a>
Domain	<a href="#"><u>ProjectedCRS</u></a>

## 6.2.2. Property: geosrs:conversion

**Table 7** — geosrs:conversion

URI	<a href="https://w3id.org/geosrs/srs/conversion"><u>https://w3id.org/geosrs/srs/conversion</u></a>
Type	<a href="#"><u>owl:ObjectProperty</u></a>
Definition	The conversion used to define a projected coordinate reference system. Cf. ISO 19111:2007:2007-07, table 7, named association Definition.
Range	<a href="#"><u>Conversion</u></a>
Domain	<a href="#"><u>CRS</u></a>

## 6.2.3. Property: geosrs:coordinateSystem

**Table 8** — geosrs:coordinateSystem

URI	<a href="https://w3id.org/geosrs/srs/coordinateSystem"><u>https://w3id.org/geosrs/srs/coordinateSystem</u></a>
Type	<a href="#"><u>owl:ObjectProperty</u></a>
Definition	The property relates a coordinate reference system to its coordinate system
Range	<a href="#"><u>CoordinateSystem</u></a>
Domain	<a href="#"><u>CRS</u></a>
Example	<a href="#"><u>geosrs:coordinateSystem</u></a>

## 6.2.4. Property: geosrs:datum

**Table 9** — geosrs:datum

URI	<a href="https://w3id.org/geosrs/srs/datum">https://w3id.org/geosrs/srs/datum</a>
Type	<a href="#">owl:ObjectProperty</a>
Definition	The property relates a coordinate reference system to a datum
Range	<a href="#">Datum</a>
Domain	<a href="#">CRS</a>

## 6.2.5. Property: geosrs:datumEnsemble

**Table 10** — geosrs:datumEnsemble

URI	<a href="https://w3id.org/geosrs/srs/datumEnsemble">https://w3id.org/geosrs/srs/datumEnsemble</a>
Type	<a href="#">owl:ObjectProperty</a>
Definition	Indicates a single CRS referring to a collection of one or more datums (Datum Ensemble)
Range	<a href="#">DatumEnsemble</a>
Domain	<a href="#">SingleCRS</a>

## 6.2.6. Property: geosrs:domainOfValidity

**Table 11** — geosrs:domainOfValidity

URI	<a href="https://w3id.org/geosrs/srs/domainOfValidity">https://w3id.org/geosrs/srs/domainOfValidity</a>
Type	<a href="#">owl:ObjectProperty</a>
Definition	Geographic area or time interval in which the referring object is valid. Cf. ISO 19111:2007:2007-07, tables 4, 33 and 42, attribute domainOfValidity.

Range	<a href="#"><u>AreaOfUse</u></a>
Domain	<a href="#"><u>CRS</u></a>

## 6.2.7. Property: geosrs:method

**Table 12** — geosrs:method

URI	<a href="https://w3id.org/geosrs/srs/method"><u>https://w3id.org/geosrs/srs/method</u></a>
Type	<a href="#"><u>owl:ObjectProperty</u></a>
Range	<a href="#"><u>CoordinateOperation</u></a>
Domain	<a href="#"><u>CRS</u></a>

## 6.2.8. Property: geocrs:asProj4

**Table 13** — geocrs:asProj4

URI	geocrs:asProj4
Type	<a href="#"><u>owl:DatatypeProperty</u></a>
Definition	PROJ4 string defining a CRS. Note: this paradigm is ambiguous and presently considered outdated.
Range	<a href="#"><u>proj4Literal</u></a>
Domain	<a href="#"><u>CRS</u></a>

## 6.2.9. Property: geocrs:asProjJSON

**Table 14** — geocrs:asProjJSON

URI	geocrs:asProjJSON
Type	<a href="#"><u>owl:DatatypeProperty</u></a>



Definition	CRS definition encoded as a JSON object interpretable by PROJ4.
Range	<a href="#"><u>projJSONLiteral</u></a>
Domain	<a href="#"><u>CRS</u></a>

### 6.2.10. Property: geocrs:asWKT

**Table 15** — geocrs:asWKT

URI	geocrs:asWKT
Type	<a href="#"><u>owl:DatatypeProperty</u></a>
Definition	CRS definition encoded according to the Well Known Text structure. Cf. ISO 19162:2019.
Range	<a href="#"><u>wktLiteral</u></a>
Domain	<a href="#"><u>CRS</u></a>

### 6.2.11. Property: geosrs:EPSGcode

**Table 16** — geosrs:EPSGcode

URI	<a href="https://w3id.org/geosrs/srs/EPSGcode"><u>https://w3id.org/geosrs/srs/EPSGcode</u></a>
Type	<a href="#"><u>owl:DatatypeProperty</u></a>
Definition	Identifier of this resource in the EPSG Geodetic Parameter Dataset.
Range	<a href="#"><u>xsd:string</u></a>

## 6.3. Coordinate Reference System Types

---

## REQUIREMENT 3: COORDINATE REFERENCE SYSTEM TYPES

**IDENTIFIER** /req/Coordinate\_Reference\_System\_Types

**STATEMENT** Implementations shall allow the RDFS classes geosrs:BoundCRS, geosrs:CompoundCRS, geosrs:CRS, geosrs:EngineeringCRS, geosrs:GeocentricCRS, geosrs:GeodeticCRS, geosrs:GeographicCRS, geosrs:ParametricCRS, geosrs:ProjectedCRS, geosrs:SelenographicCRS, geosrs:ReferenceSystem, geosrs:SingleCRS, geosrs:SpatialReferenceSystem, geosrs:SpatioParametricCompoundCRS, geosrs:SpatioParametricTemporalCompoundCRS, geosrs:SpatioTemporalCompoundCRS, geosrs:StaticCRS, geosrs:TemporalCRS, geosrs:VerticalCRS to be used in SPARQL graph patterns.

### 6.3.1. Class: geosrs:BoundCRS

**Table 17** — geosrs:BoundCRS

URI	<a href="https://w3id.org/geosrs/srs/BoundCRS">https://w3id.org/geosrs/srs/BoundCRS</a>
Super-classes	<a href="#">CRS</a>

### 6.3.2. Class: geosrs:CompoundCRS

**Table 18** — geosrs:CompoundCRS

URI	<a href="https://w3id.org/geosrs/srs/CompoundCRS">https://w3id.org/geosrs/srs/CompoundCRS</a>
Definition	Coordinate reference system using at least two independent single coordinate reference systems. Cf. ISO 19111:2007:2007-07, parts 8.2.3.c, 8.2.4, table 6 and annex B.1.2.4.
Super-classes	<a href="#">CRS</a>
Example	<a href="#">geosrs:CompoundCRS</a>

### 6.3.3. Class: geosrs:CRS

**Table 19** — geosrs:CRS

URI	<a href="https://w3id.org/geosrs/srs/CRS">https://w3id.org/geosrs/srs/CRS</a>
-----	---

Definition	Depending on the spatial dimension of coordinates (1D, 2D, 3D), this piece of metadata is used for specifying the elements of definition associated to a given set of coordinates: its datum, its ellipsoid, its prime meridian, the type of coordinates (geocentric, geographic, projected,...), the coordinates units of measure, when appropriate the cartographic projection used, the vertical coordinate reference system.
Super-classes	<a href="#">SpatialReferenceSystem</a>

### 6.3.4. Class: geosrs:EngineeringCRS

**Table 20** — geosrs:EngineeringCRS

URI	<a href="https://w3id.org/geosrs/srs/EngineeringCRS">https://w3id.org/geosrs/srs/EngineeringCRS</a>
Definition	A contextually local coordinate reference system which can be divided into two broad categories: — earth-fixed systems applied to engineering activities on or near the surface of the earth; — CRSs on moving platforms such as road vehicles, vessels, aircraft or spacecraft.
Super-classes	<a href="#">CRS</a>

### 6.3.5. Class: geosrs:GeocentricCRS

**Table 21** — geosrs:GeocentricCRS

URI	<a href="https://w3id.org/geosrs/srs/GeocentricCRS">https://w3id.org/geosrs/srs/GeocentricCRS</a>
Definition	A cartesian coordinate reference system that represents locations in the vicinity of the Earth (including its surface, interior, atmosphere, and surrounding outer space) as X, Y, and Z measurements from its center of mass. Commonly used to track the orbits of satellites.
Super-classes	<a href="#">CRS</a>
Example	<a href="#">geosrs:GeocentricCRS</a>

### 6.3.6. Class: geosrs:GeodeticCRS

**Table 22** — geosrs:GeodeticCRS

URI	<a href="https://w3id.org/geosrs/srs/GeodeticCRS">https://w3id.org/geosrs/srs/GeodeticCRS</a>
Definition	Coordinate Reference System associated with a geodetic datum. Cf. ISO 19111:2007:2007-07, part 8.2.2.a, table 10 and annex B.1.2.1.a.
Super-classes	<a href="#">CRS</a>

### 6.3.7. Class: geosrs:GeographicCRS

**Table 23** — geosrs:GeographicCRS

URI	<a href="https://w3id.org/geosrs/srs/GeographicCRS">https://w3id.org/geosrs/srs/GeographicCRS</a>
Definition	Coordinate Reference System that has a geodetic reference frame and an ellipsoidal coordinate system
Super-classes	<a href="#">CRS</a>
Example	<a href="#">geosrs:GeographicCRS</a>

### 6.3.8. Class: geosrs:ParametricCRS

**Table 24** — geosrs:ParametricCRS

URI	<a href="https://w3id.org/geosrs/srs/ParametricCRS">https://w3id.org/geosrs/srs/ParametricCRS</a>
Definition	Coordinate Reference System based on a parametric datum
Super-classes	<a href="#">CRS</a>

### 6.3.9. Class: geosrs:ProjectedCRS

**Table 25** — geosrs:ProjectedCRS

URI	<a href="https://w3id.org/geosrs/srs/ProjectedCRS">https://w3id.org/geosrs/srs/ProjectedCRS</a>
Definition	Coordinate Reference System derived from a two-dimensional geodetic coordinate reference system by applying a map projection. Cf. ISO 19111:2007:2007-07, part 8.2.3.b, table 11 and annex B.1.2.3.
Super-classes	<a href="#">CRS</a>
Example	<a href="#">geosrs:ProjectedCRS</a>

### 6.3.10. Class: geosrs:SelenographicCRS

**Table 26** — geosrs:SelenographicCRS

URI	<a href="https://w3id.org/geosrs/srs/SelenographicCRS">https://w3id.org/geosrs/srs/SelenographicCRS</a>
Definition	Coordinate Reference System to refer locations on the surface of the Earth's Moon.
Super-classes	<a href="#">CRS</a>

### 6.3.11. Class: geosrs:ReferenceSystem

**Table 27** — geosrs:ReferenceSystem

URI	<a href="https://w3id.org/geosrs/srs/ReferenceSystem">https://w3id.org/geosrs/srs/ReferenceSystem</a>
Definition	An abstract coordinate system, whose origin, orientation and scale are specified in physical space. It is based on a set of reference points, defined as geometric points whose position is identified physically and mathematically.

### 6.3.12. Class: geosrs:SingleCRS

**Table 28** — geosrs:SingleCRS

URI	<a href="https://w3id.org/geosrs/srs/SingleCRS">https://w3id.org/geosrs/srs/SingleCRS</a>
-----	---

Definition	Coordinate reference system consisting of one coordinate system and one datum. Cf. ISO 19111:2007:2007-07, table 5.
Super-classes	<a href="#">CRS</a>

### 6.3.13. Class: geosrs:SpatialReferenceSystem

**Table 29** — geosrs:SpatialReferenceSystem

URI	<a href="https://w3id.org/geosrs/srs/SpatialReferenceSystem">https://w3id.org/geosrs/srs/SpatialReferenceSystem</a>
Definition	A spatial reference system (SRS) is a system for establishing spatial position. A spatial reference system can use geographic identifiers (place names, for example), coordinates (in which case it is a coordinate reference system), or identifiers with structured geometry (in which case it is a discrete global grid system).
Super-classes	<a href="#">ReferenceSystem</a>

### 6.3.14. Class: geosrs:SpatioParametricCompoundCRS

**Table 30** — geosrs:SpatioParametricCompoundCRS

URI	<a href="https://w3id.org/geosrs/srs/SpatioParametricCompoundCRS">https://w3id.org/geosrs/srs/SpatioParametricCompoundCRS</a>
Definition	A spatio-parametric coordinate reference system is a compound CRS in which one component is a geographic 2D, projected 2D or engineering 2D CRS, supplemented by a parametric CRS to create a three-dimensional CRS
Super-classes	<a href="#">CompoundCRS</a>

### 6.3.15. Class: geosrs:SpatioParametricTemporalCompoundCRS

**Table 31** — geosrs:SpatioParametricTemporalCompoundCRS

URI	<a href="https://w3id.org/geosrs/srs/SpatioParametricTemporalCompoundCRS">https://w3id.org/geosrs/srs/SpatioParametricTemporalCompoundCRS</a>
-----	---

Definition	Coordinate reference system combining a spatio-parametric reference system with at least one temporal reference system
Super-classes	<a href="#">SpatioParametricCompoundCRS</a>

### 6.3.16. Class: geosrs:SpatioTemporalCompoundCRS

**Table 32** — geosrs:SpatioTemporalCompoundCRS

URI	<a href="https://w3id.org/geosrs/srs/SpatioTemporalCompoundCRS">https://w3id.org/geosrs/srs/SpatioTemporalCompoundCRS</a>
Definition	Coordinate reference system combining a spatial reference system with at least one temporal reference system
Super-classes	<a href="#">CompoundCRS</a>

### 6.3.17. Class: geosrs:StaticCRS

**Table 33** — geosrs:StaticCRS

URI	<a href="https://w3id.org/geosrs/srs/StaticCRS">https://w3id.org/geosrs/srs/StaticCRS</a>
Definition	Coordinate Reference System that has a static reference frame
Super-classes	<a href="#">CRS</a>

### 6.3.18. Class: geosrs:TemporalCRS

**Table 34** — geosrs:TemporalCRS

URI	<a href="https://w3id.org/geosrs/srs/TemporalCRS">https://w3id.org/geosrs/srs/TemporalCRS</a>
Definition	Coordinate Reference System based on a temporal datum
Super-classes	<a href="#">CRS</a>

## 6.3.19. Class: geosrs:VerticalCRS

**Table 35** — geosrs:VerticalCRS

URI	<a href="https://w3id.org/geosrs/srs/VerticalCRS">https://w3id.org/geosrs/srs/VerticalCRS</a>
Definition	One-dimensional coordinate reference system associated with a vertical datum and used for recording heights or depths. Ellipsoidal heights are not captured in a vertical coordinate reference system but as part of a 3D coordinates tuple defined in a geodetic 3D coordinate reference system. Cf. ISO 19111:2007:2007-07, parts 8.2.2.b, table 14 and annex B.1.2.1.b.
Super-classes	<a href="#">CRS</a>
Example	<a href="#">geosrs:VerticalCRS</a>



7

# COORDINATE OPERATION MODULE

---

## COORDINATE OPERATION MODULE

This clause establishes the **Co** Requirements class, with IRI `/req/co`, which has a corresponding Conformance Class, **Co**, with IRI `/conf/co`.

### REQUIREMENTS CLASS 2: 07-CO\_MODULE.ADOC EXTENSION

IDENTIFIER	<code>/req/07-co_module.adoc</code>
TARGET TYPE	Implementation Specification
REQUIREMENT	<code>/req/Coordinate_Operation_Methods</code>
	<code>/req/Coordinate_Operation_Parameters</code>
	<code>/req/Coordinate_Operation_Categories</code>
	<code>/req/Coordinate_Operation_Properties</code>

## 7.1. Coordinate Operation Categories

### REQUIREMENT 4: COORDINATE OPERATION CATEGORIES

IDENTIFIER	<code>/req/Coordinate_Operation_Categories</code>
STATEMENT	Implementations shall allow the RDFS classes <code>geosrs:GeographicObject</code> , <code>geosrs:RegisterOperations</code> , <code>geosrs:ScaleOperation</code> , <code>geosrs:RotationOperation</code> , <code>geosrs:IdentityOperation</code> , <code>geosrs:ShearOperation</code> , <code>geosrs:TranslationOperation</code> , <code>geosrs:AffineTransformationOperation</code> , <code>geocrs:CoordinateTransformationOperation</code> to be used in SPARQL graph patterns.

### 7.1.1. Class: `geosrs:GeographicObject`

Table 36 — `geosrs:GeographicObject`

URI	<a href="https://w3id.org/geosrs/co/GeographicObject">https://w3id.org/geosrs/co/GeographicObject</a>
Definition	Identifier of a geographic feature of which the coordinates are used as operation parameters.

Super-classes	<a href="#">iso19107:Geometry[iso19107:Geometry]</a>
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### 7.1.2. Class: geosrs:RegisterOperations

**Table 37** — geosrs:RegisterOperations

URI	<a href="https://w3id.org/geosrs/co/RegisterOperations">https://w3id.org/geosrs/co/RegisterOperations</a>
Definition	Operations supported in the Coordinate Operations package.

### 7.1.3. Class: geosrs:ScaleOperation

**Table 38** — geosrs:ScaleOperation

URI	<a href="https://w3id.org/geosrs/co/ScaleOperation">https://w3id.org/geosrs/co/ScaleOperation</a>
Definition	Scale transformation operation
Super-classes	<a href="#">AffineTransformationOperation</a>

### 7.1.4. Class: geosrs:RotationOperation

**Table 39** — geosrs:RotationOperation

URI	<a href="https://w3id.org/geosrs/co/RotationOperation">https://w3id.org/geosrs/co/RotationOperation</a>
Definition	Rotation transformation operation
Super-classes	<a href="#">AffineTransformationOperation</a>

### 7.1.5. Class: geosrs:IdentityOperation

**Table 40** — geosrs:IdentityOperation

URI	<a href="https://w3id.org/geosrs/co/IdentityOperation">https://w3id.org/geosrs/co/IdentityOperation</a>
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Definition	Identity transformation operation
Super-classes	<a href="#"><u>AffineTransformationOperation</u></a>

### 7.1.6. Class: geosrs:ShearOperation

**Table 41** — geosrs:ShearOperation

URI	<a href="https://w3id.org/geosrs/co/ShearOperation"><u>https://w3id.org/geosrs/co/ShearOperation</u></a>
Definition	Shear transformation operation
Super-classes	<a href="#"><u>AffineTransformationOperation</u></a>

### 7.1.7. Class: geosrs:TranslationOperation

**Table 42** — geosrs:TranslationOperation

URI	<a href="https://w3id.org/geosrs/co/TranslationOperation"><u>https://w3id.org/geosrs/co/TranslationOperation</u></a>
Definition	Translation transformation operation
Super-classes	<a href="#"><u>AffineTransformationOperation</u></a>

### 7.1.8. Class: geosrs:AffineTransformationOperation

**Table 43** — geosrs:AffineTransformationOperation

URI	<a href="https://w3id.org/geosrs/co/AffineTransformationOperation"><u>https://w3id.org/geosrs/co/AffineTransformationOperation</u></a>
Definition	Affine coordinate transformation operation
Super-classes	<a href="#"><u>CoordinateTransformationOperation</u></a> []

### 7.1.9. Class: geocrs:CoordinateTransformationOperation

**Table 44** — geocrs:CoordinateTransformationOperation

URI	<a href="#">geocrs:CoordinateTransformationOperation[]</a>
Definition	Coordinate operation in which the two coordinate reference systems are based on different datums.
Super-classes	<a href="#">SingleOperation</a>

## 7.2. Coordinate Operation Methods

REQUIREMENT 5: COORDINATE OPERATION METHODS	
IDENTIFIER	<a href="#">/req/Coordinate_Operation_Methods</a>
STATEMENT	Implementations shall allow the RDFS classes <a href="#">geocrs:CoordinateOperation</a> , <a href="#">geocrs:PassThroughOperation</a> , <a href="#">geocrs:ConcatenatedOperation</a> , <a href="#">geocrs:SingleOperation</a> , <a href="#">geocrs:Transformation</a> , <a href="#">geocrs:Conversion</a> , <a href="#">geocrs:PointMotionOperation</a> , <a href="#">geocrs:OperationMethod</a> to be used in SPARQL graph patterns.

### 7.2.1. Class: [geocrs:PassThroughOperation](#)

**Table 45** — [geocrs:PassThroughOperation](#)

URI	<a href="https://w3id.org/geosrs/co/PassThroughOperation">https://w3id.org/geosrs/co/PassThroughOperation</a>
Definition	Specification of a subset of coordinate tuples that is subject to a coordinate operation
Super-classes	<a href="#">CoordinateOperation</a>

### 7.2.2. Class: [geocrs:ConcatenatedOperation](#)

**Table 46** — [geocrs:ConcatenatedOperation](#)

URI	<a href="https://w3id.org/geosrs/co/ConcatenatedOperation">https://w3id.org/geosrs/co/ConcatenatedOperation</a>
Definition	Ordered sequence of two or more single coordinate operations. Note: The sequence of coordinate operations is constrained by the requirement that the source

	<p>coordinate reference system of step (n + 1) shall be the same as the target coordinate reference system of step (n). The source coordinate reference system of the first step and the target coordinate reference system of the last step are the source and target coordinate reference system associated with the concatenated coordinate operation. For a concatenated coordinate operation sequence of n coordinate operations: source CRS (concatenated coordinate operation) .eq. source CRS (coordinate operation step 1) target CRS (coordinate operation step i) .eq. source CRS (coordinate operation step i + 1); i .eq. 1 ... (n – 1) target CRS (concatenated coordinate operation) .eq. target CRS (coordinate operation step n) Instead of a forward coordinate operation, an inverse coordinate operation may be used for one or more of the coordinate operation steps mentioned above, if the inverse coordinate operation is uniquely defined by the forward coordinate operation method.</p>
Super-classes	<a href="#">CoordinateOperation</a>

### 7.2.3. Class: geosrs:PointMotionOperation

Table 47 — geosrs:PointMotionOperation

URI	<a href="https://w3id.org/geosrs/co/PointMotionOperation">https://w3id.org/geosrs/co/PointMotionOperation</a>
Definition	<p>Mathematical operation that describes the change of coordinate values within one coordinate reference system due to the motion of the point between one coordinate epoch and another coordinate epoch Note: In this document the motion is due to tectonic plate movement or deformation.</p>
Super-classes	<a href="#">SingleOperation</a>

## 7.3. Coordinate Operation Parameters

## REQUIREMENT 6: COORDINATE OPERATION PARAMETERS

IDENTIFIER	/req/Coordinate_Operation_Parameters
STATEMENT	Implementations shall allow the RDFS classes geosrs:GeneralOperationParameter, geosrs:OperationParameterGroup, geosrs:OperationParameter, geosrs:GeneralParameterValue, geosrs:ParameterValueGroup, geosrs:OperationParameterValue to be used in SPARQL graph patterns.

### 7.3.1. Class: geosrs:OperationParameterGroup

Table 48 — geosrs:OperationParameterGroup

URI	<a href="https://w3id.org/geosrs/co/OperationParameterGroup">https://w3id.org/geosrs/co/OperationParameterGroup</a>
Definition	Definition of a group of related parameters used by a coordinate operation method.
Super-classes	<a href="#">GeneralOperationParameter</a>

### 7.3.2. Class: geosrs:ParameterValueGroup

Table 49 — geosrs:ParameterValueGroup

URI	<a href="https://w3id.org/geosrs/co/ParameterValueGroup">https://w3id.org/geosrs/co/ParameterValueGroup</a>
Definition	Group of related parameter values. Note: The same group can be repeated more than once in a coordinate operation or higher level ParameterValueGroup, if those instances contain different values of one or more ParameterValues which suitably distinguish among those groups.
Super-classes	<a href="#">GeneralParameterValue</a>

## 7.4. Coordinate Operation Properties

## REQUIREMENT 7: COORDINATE OPERATION PROPERTIES

**IDENTIFIER** /req/Coordinate\_Operation\_Properties

**STATEMENT** Implementations shall allow the RDFS properties `geosrs:derivingConversion`, `geosrs:parameter`, `geosrs:sourceCRS`, `geosrs:targetCRS` to be used in SPARQL graph patterns.

### 7.4.1. Property: `geosrs:derivingConversion`

**Table 50** — `geosrs:derivingConversion`

URI	<a href="https://w3id.org/geosrs/co/derivingConversion">https://w3id.org/geosrs/co/derivingConversion</a>
Type	<a href="#">owl:ObjectProperty</a>
Definition	Relates a derived CRS to a conversion
Range	<a href="#">Conversion</a>
Domain	<a href="#">DerivedCRS</a>

### 7.4.2. Property: `geosrs:parameter`

**Table 51** — `geosrs:parameter`

URI	<a href="https://w3id.org/geosrs/co/parameter">https://w3id.org/geosrs/co/parameter</a>
Type	<a href="#">owl:ObjectProperty</a>
Definition	Value of the datum-defining parameter
Range	<a href="#">OperationParameter</a>
Domain	<a href="#">Conversion</a>

### 7.4.3. Property: `geosrs:sourceCRS`



**Table 52** — geosrs:sourceCRS

URI	<a href="https://w3id.org/geosrs/co/sourceCRS">https://w3id.org/geosrs/co/sourceCRS</a>
Type	<a href="#">owl:ObjectProperty</a>
Definition	The coordinate reference system associated to the data used as input of a given operation. Cf. ISO 19111:2007:2007-07, table 42, named association Source.
Range	<a href="#">CRS</a>
Domain	<a href="#">CoordinateOperation</a>
Example	<a href="#">geosrs:sourceCRS</a>

#### 7.4.4. Property: geosrs:targetCRS

**Table 53** — geosrs:targetCRS

URI	<a href="https://w3id.org/geosrs/co/targetCRS">https://w3id.org/geosrs/co/targetCRS</a>
Type	<a href="#">owl:ObjectProperty</a>
Definition	The coordinate reference system associated to the data obtained as output of a given operation. Cf. ISO 19111:2007:2007-07, table 42, named association Target.
Range	<a href="#">CRS</a>
Domain	<a href="#">CoordinateOperation</a>



8

# COORDINATE SYSTEM MODULE

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This clause establishes the **CS** Requirements class, with IRI `/req/cs`, which has a corresponding Conformance Class, **CS**, with IRI `/conf/cs`.

The coordinate system module introduces different types of coordinate systems which are distinguished in geospatial science and applications. Coordinate systems are distinguished by their area of use, i.e planetary or interstellar and by their multidimensionality.

## REQUIREMENTS CLASS 3: 08-CS\_MODULE.ADOC EXTENSION

IDENTIFIER	<code>/req/08-cs_module.adoc</code>
TARGET TYPE	Implementation Specification
REQUIREMENT	<code>/req/Temporal_Coordinate_Systems</code>
	<code>/req/3D_Coordinate_Systems</code>
	<code>/req/Coordinate_System_Types</code>
	<code>/req/Celestial_Coordinate_Systems</code>
	<code>/req/Coordinate_System_Components</code>
	<code>/req/Coordinate_System_Properties</code>

## 8.1. 3D Coordinate Systems

### REQUIREMENT 8: 3D COORDINATE SYSTEMS

IDENTIFIER	<code>/req/3D_Coordinate_Systems</code>
STATEMENT	Implementations shall allow the RDFS classes <code>geosrs:3DCoordinateSystem</code> , <code>geosrs:ConicalCoordinateSystem</code> , <code>geosrs:CylindricalCoordinateSystem</code> , <code>geosrs:EllipsoidalCoordinateSystem</code> , <code>geosrs:SphericalCoordinateSystem</code> to be used in SPARQL graph patterns.

### 8.1.1. Class: geosrs:3DCoordinateSystem

geosrs:3DCoordinateSystem

Table 54

URI	<a href="https://w3id.org/geosrs/cs/3DCoordinateSystem">https://w3id.org/geosrs/cs/3DCoordinateSystem</a>
Definition	Non-repeating sequence of coordinate system axes that spans a given coordinate space in three dimensions
Super-classes	<a href="#">CoordinateSystem</a>
Example	<a href="#">geosrs:3DCoordinateSystem</a>

### 8.1.2. Class: geosrs:ConicalCoordinateSystem

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geosrs:ConicalCoordinateSystem

Table 55

URI	<a href="https://w3id.org/geosrs/cs/ConicalCoordinateSystem">https://w3id.org/geosrs/cs/ConicalCoordinateSystem</a>
Definition	A conical coordinate system is a three-dimensional orthogonal coordinate system consisting of concentric spheres (described by their radius $r$ ) and by two families of perpendicular cones, aligned along the $z$ - and $x$ -axes, respectively
Super-classes	<a href="#">OrthogonalCoordinateSystem</a>

### 8.1.3. Class: geosrs:CylindricalCoordinateSystem

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geosrs:CylindricalCoordinateSystem

Table 56

URI	<a href="https://w3id.org/geosrs/cs/CylindricalCoordinateSystem">https://w3id.org/geosrs/cs/CylindricalCoordinateSystem</a>
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Definition	Three-dimensional coordinate system in Euclidean space in which position is specified by two linear coordinates and one angular coordinate
Super-classes	<a href="#">3DCoordinateSystem</a>

## 8.2. Celestial Coordinate Systems

REQUIREMENT 9: CELESTIAL COORDINATE SYSTEMS	
IDENTIFIER	<code>/req/Celestial_Coordinate_Systems</code>
STATEMENT	Implementations shall allow the RDFS classes <code>geosrs:CelestialCoordinateSystem</code> , <code>geosrs:EclipticCoordinateSystem</code> , <code>geosrs:EquatorialCoordinateSystem</code> , <code>geosrs:GalacticCoordinateSystem</code> , <code>geosrs:HorizontalCoordinateSystem</code> , <code>geosrs:PerifocalCoordinateSystem</code> , <code>geosrs:SuperGalacticCS</code> to be used in SPARQL graph patterns.

### 8.2.1. Class: `geosrs:CelestialCoordinateSystem`

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`geosrs:CelestialCoordinateSystem`

Table 57

URI	<a href="https://w3id.org/geosrs/cs/CelestialCoordinateSystem">https://w3id.org/geosrs/cs/CelestialCoordinateSystem</a>
Definition	A coordinate system for specifying positions of celestial objects relative to physical reference points
Super-classes	<a href="#">CoordinateSystem</a>

### 8.2.2. Class: `geosrs:EclipticCoordinateSystem`

.

`geosrs:EclipticCoordinateSystem`

Table 58

URI	<a href="https://w3id.org/geosrs/cs/EclipticCoordinateSystem">https://w3id.org/geosrs/cs/EclipticCoordinateSystem</a>
Definition	An ecliptic coordinate system is used for representing the apparent positions and orbits of solar system objects.
Super-classes	<a href="#">CelestialCoordinateSystem</a>

### 8.2.3. Class: geosrs:EquatorialCoordinateSystem

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geosrs:EquatorialCoordinateSystem

Table 59

URI	<a href="https://w3id.org/geosrs/cs/EquatorialCoordinateSystem">https://w3id.org/geosrs/cs/EquatorialCoordinateSystem</a>
Definition	A celestial coordinate system in which an object's position on the celestial sphere is described in terms of its north-south declination and east-west right ascension, measured relative to the celestial equator and vernal equinox, respectively.
Super-classes	<a href="#">CelestialCoordinateSystem</a>

### 8.2.4. Class: geosrs:GalacticCoordinateSystem

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geosrs:GalacticCoordinateSystem

Table 60

URI	<a href="https://w3id.org/geosrs/cs/GalacticCoordinateSystem">https://w3id.org/geosrs/cs/GalacticCoordinateSystem</a>
Definition	A coordinate system with the Sun as its center, the primary direction aligned with the approximate center of the Milky Way Galaxy, and the fundamental plane parallel to an approximation of the galactic plane but offset to its north.
Super-classes	<a href="#">CelestialCoordinateSystem</a> <a href="#">3DCoordinateSystem</a>

### 8.2.5. Class: geosrs:HorizontalCoordinateSystem

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geosrs:HorizontalCoordinateSystem

Table 61

URI	<a href="https://w3id.org/geosrs/cs/HorizontalCoordinateSystem">https://w3id.org/geosrs/cs/HorizontalCoordinateSystem</a>
Definition	A horizontal coordinate system is a celestial coordinate system that uses the observer's local horizon as the fundamental plane.
Super-classes	<a href="#">CelestialCoordinateSystem</a>

### 8.2.6. Class: geosrs:PerifocalCoordinateSystem

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geosrs:PerifocalCoordinateSystem

Table 62

URI	<a href="https://w3id.org/geosrs/cs/PerifocalCoordinateSystem">https://w3id.org/geosrs/cs/PerifocalCoordinateSystem</a>
Definition	A frame of reference centered at the focus of the orbit, i. e. the celestial body about which the orbit is centered.
Super-classes	<a href="#">CelestialCoordinateSystem</a>

### 8.2.7. Class: geosrs:SuperGalacticCS

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geosrs:SuperGalacticCS

Table 63

URI	<a href="https://w3id.org/geosrs/cs/SuperGalacticCS">https://w3id.org/geosrs/cs/SuperGalacticCS</a>
Definition	A reference frame for the supercluster of galaxies that contains the Milky Way galaxy, referenced to a local

	relatively flat collection of galaxy clusters used to define the supergalactic plane.
Super-classes	<a href="#">CelestialCoordinateSystem</a> <a href="#">3DCoordinateSystem</a>

## 8.3. Coordinate System Components

Requirement 10: Coordinate System Components	
IDENTIFIER	/req/Coordinate_System_Components
STATEMENT	Implementations shall allow the RDFS classes <code>geosrs:CoordinateSystemAxis</code> to be used in SPARQL graph patterns.

## 8.4. Coordinate System Properties

Requirement 11: Coordinate System Properties	
IDENTIFIER	/req/Coordinate_System_Properties
STATEMENT	Implementations shall allow the RDFS properties <code>geosrs:axis</code> , <code>geosrs:axisDirection</code> to be used in SPARQL graph patterns.

### 8.4.1. Property: `geosrs:axis`

Table 64 — `geosrs:axis`

URI	<a href="https://w3id.org/geosrs/cs/axis">https://w3id.org/geosrs/cs/axis</a>
Type	<a href="#">owl:ObjectProperty</a>
Definition	The property relates a coordinate system to one of its axis
Range	<a href="#">Axis</a>



Domain	<a href="#">CoordinateSystem</a>
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### 8.4.2. Property: geosrs:axisDirection

Table 65 — geosrs:axisDirection

URI	<a href="https://w3id.org/geosrs/cs/axisDirection">https://w3id.org/geosrs/cs/axisDirection</a>
Type	<a href="#">owl:ObjectProperty</a>
Definition	The direction of an axis. Cf. ISO 19111:2007:2007-07, table 27, attribute coordinate system axis direction.
Range	<a href="#">AxisDirection</a>
Domain	<a href="#">Axis</a>
Example	<a href="#">geosrs:axisDirection</a>

## 8.5. Coordinate System Types

Requirement 12: Coordinate System Types	
IDENTIFIER	/req/Coordinate_System_Types
STATEMENT	Implementations shall allow the RDFS classes geosrs:CoordinateSystem, geosrs:AffineCoordinateSystem, geosrs:BarycentricCoordinateSystem, geosrs:CartesianCoordinateSystem, geosrs:CurvilinearCoordinateSystem, geosrs:EngineeringCoordinateSystem, geosrs:GeodeticCoordinateSystem, geosrs:GeographicalCoordinateSystem, geosrs:GridCoordinateSystem, geosrs:HexagonalCoordinateSystem, geosrs:LocalCoordinateSystem, geosrs:ObliqueCoordinateSystem, geosrs:OrdinalCoordinateSystem, geosrs:OrthogonalCoordinateSystem, geosrs:ParametricCoordinateSystem, geosrs:PlanarCoordinateSystem, geosrs:PolarCoordinateSystem, geosrs:VerticalCoordinateSystem to be used in SPARQL graph patterns.

### 8.5.1. Class: geosrs:AffineCoordinateSystem

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geosrs:AffineCoordinateSystem

Table 66

URI	<a href="https://w3id.org/geosrs/cs/AffineCoordinateSystem">https://w3id.org/geosrs/cs/AffineCoordinateSystem</a>
Definition	Coordinate system in Euclidean space with straight axes that are not necessarily mutually perpendicular
Super-classes	<a href="#">CoordinateSystem</a>

### 8.5.2. Class: geosrs:BarycentricCoordinateSystem

.

geosrs:BarycentricCoordinateSystem

Table 67

URI	<a href="https://w3id.org/geosrs/cs/BarycentricCoordinateSystem">https://w3id.org/geosrs/cs/BarycentricCoordinateSystem</a>
Definition	A coordinate system in which the location of a point is specified by reference to a simplex (a triangle for points in a plane, a tetrahedron for points in three-dimensional space, etc.)
Super-classes	<a href="#">CoordinateSystem</a>

### 8.5.3. Class: geosrs:CurvilinearCoordinateSystem

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geosrs:CurvilinearCoordinateSystem

Table 68

URI	<a href="https://w3id.org/geosrs/cs/CurvilinearCoordinateSystem">https://w3id.org/geosrs/cs/CurvilinearCoordinateSystem</a>
Definition	A coordinate system for the Euclidean space in which the coordinate lines may be curved
Super-classes	<a href="#">CoordinateSystem</a>

### 8.5.4. Class: geosrs:EngineeringCoordinateSystem

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geosrs:EngineeringCoordinateSystem

Table 69

URI	<a href="https://w3id.org/geosrs/cs/EngineeringCoordinateSystem">https://w3id.org/geosrs/cs/EngineeringCoordinateSystem</a>
Definition	Coordinate system used by an engineering coordinate reference system, one of an affine coordinate system, a Cartesian coordinate system, a cylindrical coordinate system, a linear coordinate sytem, an ordinal coordinate system, a polar coordinate system or a spherical coordinate system
Super-classes	<a href="#">CoordinateSystem</a>

### 8.5.5. Class: geosrs:GeodeticCoordinateSystem

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geosrs:GeodeticCoordinateSystem

Table 70

URI	<a href="https://w3id.org/geosrs/cs/GeodeticCoordinateSystem">https://w3id.org/geosrs/cs/GeodeticCoordinateSystem</a>
Definition	Coordinate system used by a Geodetic CRS, one of a Cartesian coordinate system or a spherical coordinate system.
Super-classes	<a href="#">CoordinateSystem</a>

### 8.5.6. Class: geosrs:GeographicalCoordinateSystem

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geosrs:GeographicalCoordinateSystem

Table 71

URI	<a href="https://w3id.org/geosrs/cs/GeographicalCoordinateSystem">https://w3id.org/geosrs/cs/GeographicalCoordinateSystem</a>
Definition	Spherical or geodetic coordinate system for measuring and communicating positions directly on Earth as latitude and longitude.
Super-classes	<a href="#">SphericalCoordinateSystem</a> <a href="#">GeodeticCoordinateSystem</a>

### 8.5.7. Class: geosrs:GridCoordinateSystem

.

geosrs:GridCoordinateSystem

Table 72

URI	<a href="https://w3id.org/geosrs/cs/GridCoordinateSystem">https://w3id.org/geosrs/cs/GridCoordinateSystem</a>
Definition	A grid coordinate system identifies areas within a grid.
Super-classes	<a href="#">CoordinateSystem</a>

### 8.5.8. Class: geosrs:HexagonalCoordinateSystem

.

geosrs:HexagonalCoordinateSystem

Table 73

URI	<a href="https://w3id.org/geosrs/cs/HexagonalCoordinateSystem">https://w3id.org/geosrs/cs/HexagonalCoordinateSystem</a>
Definition	A hexagonal coordinate system identifies areas within a hexagonal lattice.
Super-classes	<a href="#">GridCoordinateSystem</a>

### 8.5.9. Class: geosrs:LocalCoordinateSystem

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geosrs:LocalCoordinateSystem

Table 74

URI	<a href="https://w3id.org/geosrs/cs/LocalCoordinateSystem">https://w3id.org/geosrs/cs/LocalCoordinateSystem</a>
Definition	Coordinate system with a point of local reference.
Super-classes	<a href="#">CoordinateSystem</a>

### 8.5.10. Class: geosrs:ObliqueCoordinateSystem

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geosrs:ObliqueCoordinateSystem

Table 75

URI	<a href="https://w3id.org/geosrs/cs/ObliqueCoordinateSystem">https://w3id.org/geosrs/cs/ObliqueCoordinateSystem</a>
Definition	A plane coordinate system whose axes are not perpendicular.
Super-classes	<a href="#">CoordinateSystem</a>

### 8.5.11. Class: geosrs:OrthogonalCoordinateSystem

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geosrs:OrthogonalCoordinateSystem

Table 76

URI	<a href="https://w3id.org/geosrs/cs/OrthogonalCoordinateSystem">https://w3id.org/geosrs/cs/OrthogonalCoordinateSystem</a>
Definition	A orthogonal coordinate system is a system of curvilinear coordinates in which each family of surfaces intersects the others at right angles.
Super-classes	<a href="#">CurvilinearCoordinateSystem</a>

### 8.5.12. Class: geosrs:PlanarCoordinateSystem

.

geosrs:PlanarCoordinateSystem

Table 77

URI	<a href="https://w3id.org/geosrs/cs/PlanarCoordinateSystem">https://w3id.org/geosrs/cs/PlanarCoordinateSystem</a>
Definition	A two-dimensional measurement system that locates features on a plane based on their distance from an origin (0,0) along two perpendicular axes.
Super-classes	<a href="#">CoordinateSystem</a>
Example	<a href="#">geosrs:PlanarCoordinateSystem</a>

## 8.6. Temporal Coordinate Systems

REQUIREMENT 13: TEMPORAL COORDINATE SYSTEMS	
IDENTIFIER	/req/Temporal_Coordinate_Systems
STATEMENT	Implementations shall allow the RDFS classes geosrs:1DCoordinateSystem, geosrs:DateTimeTemporalCoordinateSystem, geosrs:TemporalCountCoordinateSystem, geosrs:TemporalCoordinateSystem, geosrs:TemporalMeasureCoordinateSystem to be used in SPARQL graph patterns.

### 8.6.1. Class: geosrs:1DCoordinateSystem

geosrs:1DCoordinateSystem

Table 78

URI	<a href="https://w3id.org/geosrs/cs/1DCoordinateSystem">https://w3id.org/geosrs/cs/1DCoordinateSystem</a>
Definition	Non-repeating sequence of coordinate system axes that spans a given coordinate space in one dimension

Super-classes	<a href="#"><u>CoordinateSystem</u></a>
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## 8.6.2. Class: geosrs:DateTimeTemporalCoordinateSystem

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geosrs:DateTimeTemporalCoordinateSystem

Table 79

URI	<a href="https://w3id.org/geosrs/cs/DateTimeTemporalCoordinateSystem"><u>https://w3id.org/geosrs/cs/DateTimeTemporalCoordinateSystem</u></a>
Definition	One-dimensional coordinate system used to record time in dateTime representation as defined in ISO 8601.
Super-classes	<a href="#"><u>TemporalCoordinateSystem</u></a>

## 8.6.3. Class: geosrs:TemporalCountCoordinateSystem

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geosrs:TemporalCountCoordinateSystem

Table 80

URI	<a href="https://w3id.org/geosrs/cs/TemporalCountCoordinateSystem"><u>https://w3id.org/geosrs/cs/TemporalCountCoordinateSystem</u></a>
Definition	One-dimensional coordinate system used to record time as an integer count.
Super-classes	<a href="#"><u>TemporalCoordinateSystem</u></a>

## 8.6.4. Class: geosrs:TemporalCoordinateSystem

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geosrs:TemporalCoordinateSystem

Table 81

URI	<a href="https://w3id.org/geosrs/cs/TemporalCoordinateSystem"><u>https://w3id.org/geosrs/cs/TemporalCoordinateSystem</u></a>
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Definition	One-dimensional coordinate system where the axis is time.
Super-classes	<a href="#"><u>1DCoordinateSystem</u></a>

### 8.6.5. Class: geosrs:TemporalMeasureCoordinateSystem

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geosrs:TemporalMeasureCoordinateSystem

Table 82

URI	<a href="https://w3id.org/geosrs/cs/TemporalMeasureCoordinateSystem"><u>https://w3id.org/geosrs/cs/TemporalMeasureCoordinateSystem</u></a>
Definition	One-dimensional coordinate system used to record a time as a real number.
Super-classes	<a href="#"><u>TemporalCoordinateSystem</u></a>



9

# DATUM MODULE

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This clause establishes the **Datum** Requirements class, with IRI `/req/datum`, which has a corresponding Conformance Class, **Datum**, with IRI `/conf/datum`.

#### REQUIREMENTS CLASS 4: 09-DATUM\_MODULE.ADOC EXTENSION

IDENTIFIER	<code>/req/09-datum_module.adoc</code>
TARGET TYPE	Implementation Specification
REQUIREMENT	<code>/req/Datum_Types</code>
	<code>/req/Datum_Parameters</code>
	<code>/req/Spheroid_Types</code>
	<code>/req/Datum_Properties</code>
	<code>/req/Spheroid_Properties</code>

## 9.1. Datum Parameters

#### REQUIREMENT 14: DATUM PARAMETERS

IDENTIFIER	<code>/req/Datum_Parameters</code>
STATEMENT	Implementations shall allow the RDFS classes <code>geosrs:PrimeMeridian</code> , <code>geosrs:DefiningParameter</code> to be used in SPARQL graph patterns.

### 9.1.1. Class: `geosrs:DefiningParameter`

Table 83 — `geosrs:DefiningParameter`

URI	<a href="https://w3id.org/geosrs/datum/DefiningParameter">https://w3id.org/geosrs/datum/DefiningParameter</a>
Definition	Parameter value, an ordered sequence of values, or a reference to a file of parameter values that define

a paramtric datum. Cf. ISO 19111:2019 Geographic information — Referencing by coordinates.

## 9.2. Datum Properties

### REQUIREMENT 15: DATUM PROPERTIES

IDENTIFIER	/req/Datum_Properties
STATEMENT	Implementations shall allow the RDFS properties geosrs:datumDefiningParameter, geosrs:ellipsoid, geosrs:primeMeridian to be used in SPARQL graph patterns.

#### 9.2.1. Property: geosrs:datumDefiningParameter

Table 84 — geosrs:datumDefiningParameter

URI	<a href="https://w3id.org/geosrs/datum/datumDefiningParameter">https://w3id.org/geosrs/datum/datumDefiningParameter</a>
Type	<a href="#">owl:ObjectProperty</a>
Definition	Parameter used to define the parametric datum
Range	<a href="#">DefiningParameter</a>
Domain	<a href="#">ParametricDatum</a>

#### 9.2.2. Property: geosrs:ellipsoid

Table 85 — geosrs:ellipsoid

URI	<a href="https://w3id.org/geosrs/datum/ellipsoid">https://w3id.org/geosrs/datum/ellipsoid</a>
Type	<a href="#">owl:ObjectProperty</a>
Definition	The properties relates a datum to its ellipsoid definition
Range	<a href="#">Ellipsoid</a>

Domain	<u>Datum</u>
Example	<u>geosrs:ellipsoid</u>

### 9.2.3. Property: geosrs:primeMeridian

**Table 86** — geosrs:primeMeridian

URI	<u><a href="https://w3id.org/geosrs/datum/primeMeridian">https://w3id.org/geosrs/datum/primeMeridian</a></u>
Type	<u>owl:ObjectProperty</u>
Definition	The prime meridian used by a geodetic datum. Cf. ISO 19111:2007:2007-07, table 34, association role prime Meridian.
Range	<u>PrimeMeridian</u>
Domain	<u>Datum</u>
Example	<u>geosrs:primeMeridian</u>

## 9.3. Datum Types

### REQUIREMENT 16: DATUM TYPES

**IDENTIFIER** /req/Datum\_Types

**STATEMENT** Implementations shall allow the RDFS classes geosrs:Datum, geosrs:GeodeticDatum, geosrs:DynamicGeodeticReferenceFrame, geosrs:VerticalDatum, geosrs:DynamicVerticalDatum, geosrs:ParametricDatum, geosrs:EngineeringDatum, geosrs:TemporalDatum, geosrs:DatumEnsemble to be used in SPARQL graph patterns.

#### 9.3.1. Class: geosrs:DynamicGeodeticReferenceFrame

**Table 87** — geosrs:DynamicGeodeticReferenceFrame

URI	<a href="https://w3id.org/geosrs/datum/DynamicGeodeticReferenceFrame">https://w3id.org/geosrs/datum/DynamicGeodeticReferenceFrame</a>
Definition	Geodetic reference frame in which some of the parameters describe time evolution of defining station coordinates Example: defining station coordinates having linear velocities to account for crustal motion.
Super-classes	<a href="#">GeodeticDatum</a>

### 9.3.2. Class: geosrs:DynamicVerticalDatum

**Table 88** — geosrs:DynamicVerticalDatum

URI	<a href="https://w3id.org/geosrs/datum/DynamicVerticalDatum">https://w3id.org/geosrs/datum/DynamicVerticalDatum</a>
Definition	Vertical reference frame in which some of the defining parameters have time dependency Example: Defining station heights have velocity to account for post-glacial isostatic rebound motion. Cf. ISO 19111:2019 Geographic information — Referencing by coordinates.
Super-classes	<a href="#">VerticalDatum</a>
Example	<a href="#">geosrs:DynamicVerticalDatum</a>

### 9.3.3. Class: geosrs:ParametricDatum

**Table 89** — geosrs:ParametricDatum

URI	<a href="https://w3id.org/geosrs/datum/ParametricDatum">https://w3id.org/geosrs/datum/ParametricDatum</a>
Definition	Textual description and/or a set of parameters identifying a particular reference surface used as the origin of a parametric coordinate system, including its position with respect to the Earth. Cf. ISO 19111:2019 Geographic information — Referencing by coordinates.
Super-classes	<a href="#">Datum</a>

### 9.3.4. Class: geosrs:EngineeringDatum

**Table 90** — geosrs:EngineeringDatum

URI	<a href="https://w3id.org/geosrs/datum/EngineeringDatum">https://w3id.org/geosrs/datum/EngineeringDatum</a>
Definition	Definition of the origin and orientation of an engineering coordinate reference systemNote: The origin can be fixed with respect to the Earth (such as a defined point at a construction site), or be a defined point on a moving vehicle (such as on a ship or satellite), or a defined point of an image. Cf. ISO 19111:2019 Geographic information — Referencing by coordinates.
Super-classes	<a href="#">Datum</a>

### 9.3.5. Class: geosrs:TemporalDatum

**Table 91** — geosrs:TemporalDatum

URI	<a href="https://w3id.org/geosrs/datum/TemporalDatum">https://w3id.org/geosrs/datum/TemporalDatum</a>
Definition	Definition of the relationship of a temporal coordinate system to an objectNote: The object is normally time on the Earth. Cf. ISO 19111:2019 Geographic information — Referencing by coordinates.
Super-classes	<a href="#">Datum</a>

### 9.3.6. Class: geosrs:DatumEnsemble

**Table 92** — geosrs:DatumEnsemble

URI	<a href="https://w3id.org/geosrs/datum/DatumEnsemble">https://w3id.org/geosrs/datum/DatumEnsemble</a>
Definition	A collection of two or more datums (or if geodetic or vertical, a collection of two or more reference frames) that are realizations of one Conventional Reference System and which for all but the highest accuracy requirements may be considered to be insignificantly different from each other. Note: Within the datum ensemble every frame or datum is constrained to be

a realization of the same reference system. Cf. ISO 19111:2019 Geographic information — Referencing by coordinates.

## 9.4. Spheroid Properties

### REQUIREMENT 17: SPHEROID PROPERTIES

IDENTIFIER	/req/Spheroid_Properties
STATEMENT	Implementations shall allow the RDFS properties geosrs:eccentricity, geosrs:inverseFlattening, geosrs:isSphere, geosrs:semiMajorAxis, geosrs:semiMinorAxis to be used in SPARQL graph patterns.

#### 9.4.1. Property: geosrs:eccentricity

Table 93 — geosrs:eccentricity

URI	<a href="https://w3id.org/geosrs/datum/eccentricity">https://w3id.org/geosrs/datum/eccentricity</a>
Type	<a href="#">owl:DatatypeProperty</a>
Definition	A measure of how much an ellipse deviates from a perfect circle.
Range	<a href="#">xsd:double</a>
Domain	<a href="#">Ellipsoid</a>
Example	<a href="#">geosrs:eccentricity</a>

#### 9.4.2. Property: geosrs:inverseFlattening

Table 94 — geosrs:inverseFlattening

URI	<a href="https://w3id.org/geosrs/datum/inverseFlattening">https://w3id.org/geosrs/datum/inverseFlattening</a>
Type	<a href="#">owl:DatatypeProperty</a>

Definition	Indicates the inverse flattening value of an ellipsoid, expressed as a number or a ratio (percentage rate, parts per million, etc.). Cf. ISO 19111:2007:2007-07, table 37, attribute inverse flattening
Range	<a href="#"><u>xsd:double</u></a>
Domain	<a href="#"><u>Ellipsoid</u></a>
Example	<a href="#"><u>geosrs:inverseFlattening</u></a>

### 9.4.3. Property: geosrs:isSphere

**Table 95** — geosrs:isSphere

URI	<a href="https://w3id.org/geosrs/datum/isSphere"><u>https://w3id.org/geosrs/datum/isSphere</u></a>
Type	<a href="#"><u>owl:DatatypeProperty</u></a>
Definition	Indicates whether the ellipsoid is a sphere. Cf. ISO 19111:2007:2007-07, table 37, attribute ellipsoid=sphere indicator.
Range	<a href="#"><u>xsd:boolean</u></a>
Domain	<a href="#"><u>Ellipsoid</u></a>

### 9.4.4. Property: geosrs:semiMajorAxis

**Table 96** — geosrs:semiMajorAxis

URI	<a href="https://w3id.org/geosrs/datum/semiMajorAxis"><u>https://w3id.org/geosrs/datum/semiMajorAxis</u></a>
Type	<a href="#"><u>owl:DatatypeProperty</u></a>
Definition	Indicates the length of the semi major axis of an ellipsoid. Cf. ISO 19111:2007:2007-07, table 36, attribute length of semi-major axis.
Range	<a href="#"><u>xsd:double</u></a>
Domain	<a href="#"><u>Ellipsoid</u></a>



Example

[geosrs:semiMajorAxis](#)

### 9.4.5. Property: geosrs:semiMinorAxis

Table 97 — geosrs:semiMinorAxis

URI	<a href="https://w3id.org/geosrs/datum/semiMinorAxis">https://w3id.org/geosrs/datum/semiMinorAxis</a>
Type	<a href="#">owl:DatatypeProperty</a>
Definition	Indicates the length of the semi minor axis of an ellipsoid. Cf. ISO 19111:2007:2007-07, table 37, attribute length of semi-minor axis.
Range	<a href="#">xsd:double</a>
Domain	<a href="#">Ellipsoid</a>
Example	<a href="#">geosrs:semiMinorAxis</a>

## 9.5. Spheroid Types

### REQUIREMENT 18: SPHEROID TYPES

IDENTIFIER      /req/Spheroid\_Types

STATEMENT      Implementations shall allow the RDFS classes geosrs:Ellipsoid, geosrs:TriaxialEllipsoid to be used in SPARQL graph patterns.

### 9.5.1. Class: geosrs:TriaxialEllipsoid

Table 98 — geosrs:TriaxialEllipsoid

URI	<a href="https://w3id.org/geosrs/datum/TriaxialEllipsoid">https://w3id.org/geosrs/datum/TriaxialEllipsoid</a>
Definition	Surface of an analytic ellipsoid defined by three axes of different length. Also referred as scalene ellipsoid.

10

# SRS APPLICATION MODULE

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This clause establishes the **SRSAPP** Requirements class, with IRI `/req/srsapp`, which has a corresponding Conformance Class, **SRSAPP**, with IRI `/conf/srsapp`.

#### REQUIREMENTS CLASS 5: 10-SRSAPPLICATION\_MODULE.ADOC EXTENSION

IDENTIFIER	<code>/req/10-srsapplication_module.adoc</code>
TARGET TYPE	Implementation Specification
REQUIREMENT	<code>/req/SRS_Application_Types</code> <code>/req/Map_Types</code>

### 10.1. Map Types

#### REQUIREMENT 19: MAP TYPES

IDENTIFIER	<code>/req/Map_Types</code>
STATEMENT	Implementations shall allow the RDFS classes <code>geosrs:CadastreMap</code> , <code>geosrs:NauticalChart</code> , <code>geosrs:ThematicMap</code> , <code>geosrs:TopographicMap</code> , <code>geosrs:WeatherMap</code> to be used in SPARQL graph patterns.

#### 10.1.1. Class: `geosrs:CadastreMap`

Table 99 — `geosrs:CadastreMap`

URI	<a href="https://w3id.org/geosrs/application/CadastreMap">https://w3id.org/geosrs/application/CadastreMap</a>
Definition	A map displaying a cadastre.
Super-classes	<a href="#"><code>SRSApplication</code></a>

### 10.1.2. Class: geosrs:NauticalChart

**Table 100** — geosrs:NauticalChart

URI	<a href="https://w3id.org/geosrs/application/NauticalChart">https://w3id.org/geosrs/application/NauticalChart</a>
Definition	A graphic representation of a sea area and adjacent coastal regions.
Super-classes	<a href="#">SRSAApplication</a>

### 10.1.3. Class: geosrs:ThematicMap

**Table 101** — geosrs:ThematicMap

URI	<a href="https://w3id.org/geosrs/application/ThematicMap">https://w3id.org/geosrs/application/ThematicMap</a>
Definition	A map used to highlight a specific phenomenon.
Super-classes	<a href="#">SRSAApplication</a>

### 10.1.4. Class: geosrs:TopographicMap

**Table 102** — geosrs:TopographicMap

URI	<a href="https://w3id.org/geosrs/application/TopographicMap">https://w3id.org/geosrs/application/TopographicMap</a>
Definition	A type of map characterized by large-scale detail and quantitative representation of relief.
Super-classes	<a href="#">SRSAApplication</a>

### 10.1.5. Class: geosrs:WeatherMap

**Table 103** — geosrs:WeatherMap

URI	<a href="https://w3id.org/geosrs/application/WeatherMap">https://w3id.org/geosrs/application/WeatherMap</a>
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Definition	A map for showing the local direction in which weather systems are moving.
Super-classes	<a href="#">SRSApplication</a>

## 10.2. SRS Application Types

### REQUIREMENT 20: SRS APPLICATION TYPES

**IDENTIFIER**     /req/SRS\_Application\_Types

**STATEMENT**

Implementations shall allow the RDFS classes `geosrs:SRSApplication`, `geosrs:SpatialReferencing`, `geosrs:EngineeringSurvey`, `geosrs:SatelliteSurvey`, `geosrs:SatelliteNavigation`, `geosrs:CoastalHydrography`, `geosrs:OffshoreEngineering`, `geosrs:Hydrography`, `geosrs:Drilling`, `geosrs:OilAndGasExploration` to be used in SPARQL graph patterns.

### 10.2.1. Class: `geosrs:SRSApplication`

**Table 104** — `geosrs:SRSApplication`

URI	<a href="https://w3id.org/geosrs/application/SRSApplication">https://w3id.org/geosrs/application/SRSApplication</a>
Definition	An application for which a spatial reference system is used.

### 10.2.2. Class: `geosrs:SpatialReferencing`

**Table 105** — `geosrs:SpatialReferencing`

URI	<a href="https://w3id.org/geosrs/application/SpatialReferencing">https://w3id.org/geosrs/application/SpatialReferencing</a>
Super-classes	<a href="#">SRSApplication</a>

### 10.2.3. Class: `geosrs:EngineeringSurvey`

**Table 106** — geosrs:EngineeringSurvey

URI	<a href="https://w3id.org/geosrs/application/EngineeringSurvey">https://w3id.org/geosrs/application/EngineeringSurvey</a>
Super-classes	<a href="#">SRSAApplication</a>

#### 10.2.4. Class: geosrs:SatelliteSurvey

**Table 107** — geosrs:SatelliteSurvey

URI	<a href="https://w3id.org/geosrs/application/SatelliteSurvey">https://w3id.org/geosrs/application/SatelliteSurvey</a>
Super-classes	<a href="#">SRSAApplication</a>

#### 10.2.5. Class: geosrs:SatelliteNavigation

**Table 108** — geosrs:SatelliteNavigation

URI	<a href="https://w3id.org/geosrs/application/SatelliteNavigation">https://w3id.org/geosrs/application/SatelliteNavigation</a>
Super-classes	<a href="#">SRSAApplication</a>

#### 10.2.6. Class: geosrs:CoastalHydrography

**Table 109** — geosrs:CoastalHydrography

URI	<a href="https://w3id.org/geosrs/application/CoastalHydrography">https://w3id.org/geosrs/application/CoastalHydrography</a>
Super-classes	<a href="#">SRSAApplication</a>

#### 10.2.7. Class: geosrs:OffshoreEngineering

**Table 110** — geosrs:OffshoreEngineering

URI	<a href="https://w3id.org/geosrs/application/OffshoreEngineering">https://w3id.org/geosrs/application/OffshoreEngineering</a>
Super-classes	<a href="#">SRSAApplication</a>

## 10.2.8. Class: geosrs:Hydrography

**Table 111** — geosrs:Hydrography

URI	<a href="https://w3id.org/geosrs/application/Hydrography">https://w3id.org/geosrs/application/Hydrography</a>
Super-classes	<a href="#">SRSAApplication</a>

## 10.2.9. Class: geosrs:Drilling

**Table 112** — geosrs:Drilling

URI	<a href="https://w3id.org/geosrs/application/Drilling">https://w3id.org/geosrs/application/Drilling</a>
Super-classes	<a href="#">SRSAApplication</a>

## 10.2.10. Class: geosrs:OilAndGasExploration

**Table 113** — geosrs:OilAndGasExploration

URI	<a href="https://w3id.org/geosrs/application/OilAndGasExploration">https://w3id.org/geosrs/application/OilAndGasExploration</a>
Super-classes	<a href="#">SRSAApplication</a>



11

# PROJECTIONS MODULE

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This clause establishes the **PROJ** Requirements class, with IRI `/req/proj`, which has a corresponding Conformance Class, **PROJ**, with IRI `/conf/proj`.

## REQUIREMENTS CLASS 6: 11-PROJECTIONS\_MODULE.ADOC EXTENSION

IDENTIFIER	<code>/req/11-projections_module.adoc</code>
TARGET TYPE	Implementation Specification
REQUIREMENT	<code>/req/Lenticular_Projections</code>
	<code>/req/Conformal_Projections</code>
	<code>/req/Minimum_Error_Projections</code>
	<code>/req/Pseudo_Azimuthal_Projections</code>
	<code>/req/Equal_Area_Projections</code>
	<code>/req/Pseudo_Conical_Projections</code>
	<code>/req/Globular_Projections</code>
	<code>/req/Pseudo_Cylindrical_Projections</code>
	<code>/req/Cylindrical_Projections</code>
	<code>/req/Compromise_Projections</code>
	<code>/req/Polyhedral_Projections</code>
	<code>/req/Equidistant_Projections</code>
	<code>/req/Conical_Projections</code>
	<code>/req/Azimuthal_Projections</code>
	<code>/req/Perspective_Projections</code>
	<code>/req/Polyconic_Projections</code>
	<code>/req/Stereographic_Projections</code>

# 11.1. Azimuthal Projections

Requirement 21: Azimuthal Projections	
IDENTIFIER	/req/Azimuthal_Projections
STATEMENT	Implementations shall allow the RDFS classes geosrs:BreusingGeometricProjection, geosrs:BreusingHarmonicProjection, geosrs:GinzburgIIProjection, geosrs:GinzburgIProjection, geosrs:GnomonicProjection, geosrs:JamesAzimuthalProjection to be used in SPARQL graph patterns.

## 11.1.1. Class: geosrs:BreusingGeometricProjection

Table 114 — geosrs:BreusingGeometricProjection

URI	<a href="https://w3id.org/geosrs/projection/BreusingGeometricProjection">https://w3id.org/geosrs/projection/BreusingGeometricProjection</a>
Super-classes	<a href="#">AzimuthalProjection</a>

## 11.1.2. Class: geosrs:BreusingHarmonicProjection

Table 115 — geosrs:BreusingHarmonicProjection

URI	<a href="https://w3id.org/geosrs/projection/BreusingHarmonicProjection">https://w3id.org/geosrs/projection/BreusingHarmonicProjection</a>
Super-classes	<a href="#">AzimuthalProjection</a>

## 11.1.3. Class: geosrs:GinzburgIIProjection

Table 116 — geosrs:GinzburgIIProjection

URI	<a href="https://w3id.org/geosrs/projection/GinzburgIIProjection">https://w3id.org/geosrs/projection/GinzburgIIProjection</a>
Super-classes	<a href="#">AzimuthalProjection</a>

### 11.1.4. Class: geosrs:GinzburgIProjection

Table 117 — geosrs:GinzburgIProjection

URI	<a href="https://w3id.org/geosrs/projection/GinzburgIProjection">https://w3id.org/geosrs/projection/GinzburgIProjection</a>
Super-classes	<a href="#">AzimuthalProjection</a>

### 11.1.5. Class: geosrs:GnomonicProjection

Table 118 — geosrs:GnomonicProjection

URI	<a href="https://w3id.org/geosrs/projection/GnomonicProjection">https://w3id.org/geosrs/projection/GnomonicProjection</a>
Super-classes	<a href="#">AzimuthalProjection</a>

### 11.1.6. Class: geosrs:JamesAzimuthalProjection

Table 119 — geosrs:JamesAzimuthalProjection

URI	<a href="https://w3id.org/geosrs/projection/JamesAzimuthalProjection">https://w3id.org/geosrs/projection/JamesAzimuthalProjection</a>
Super-classes	<a href="#">AzimuthalProjection</a>

## 11.2. Compromise Projections

### REQUIREMENT 22: COMPROMISE PROJECTIONS

IDENTIFIER	/req/Compromise_Projections
STATEMENT	Implementations shall allow the RDFS classes geosrs:ArmadilloProjection, geosrs:BakerDinomic Projection, geosrs:BertinProjection, geosrs:ChamberlinTrimetricProjection, geosrs:DenoyerSemi EllipticalProjection, geosrs:FairgrieveProjection, geosrs:LarriveeProjection, geosrs:PetermannStar Projection, geosrs:SpilhausOceanicProjection, geosrs:VanDerGrintenIIIProjection, geosrs:Winkel

## REQUIREMENT 22: COMPROMISE PROJECTIONS

IIProjection, geosrs:WinkelIIProjection, geosrs:WinkelSnyderProjection to be used in SPARQL graph patterns.

### 11.2.1. Class: geosrs:ArmadilloProjection

Table 120 — geosrs:ArmadilloProjection

URI	<a href="https://w3id.org/geosrs/projection/ArmadilloProjection">https://w3id.org/geosrs/projection/ArmadilloProjection</a>
Super-classes	<a href="#">CompromiseProjection</a>

### 11.2.2. Class: geosrs:BakerDinomicProjection

Table 121 — geosrs:BakerDinomicProjection

URI	<a href="https://w3id.org/geosrs/projection/BakerDinomicProjection">https://w3id.org/geosrs/projection/BakerDinomicProjection</a>
Super-classes	<a href="#">CompromiseProjection</a>

### 11.2.3. Class: geosrs:BertinProjection

Table 122 — geosrs:BertinProjection

URI	<a href="https://w3id.org/geosrs/projection/BertinProjection">https://w3id.org/geosrs/projection/BertinProjection</a>
Super-classes	<a href="#">CompromiseProjection</a>

### 11.2.4. Class: geosrs:ChamberlinTrimetricProjection

Table 123 — geosrs:ChamberlinTrimetricProjection

URI	<a href="https://w3id.org/geosrs/projection/ChamberlinTrimetricProjection">https://w3id.org/geosrs/projection/ChamberlinTrimetricProjection</a>
Super-classes	<a href="#">CompromiseProjection</a>

### 11.2.5. Class: geosrs:DenoyerSemiEllipticalProjection

Table 124 — geosrs:DenoyerSemiEllipticalProjection

URI	<a href="https://w3id.org/geosrs/projection/DenoyerSemiEllipticalProjection">https://w3id.org/geosrs/projection/DenoyerSemiEllipticalProjection</a>
Super-classes	<a href="#">CompromiseProjection</a>

### 11.2.6. Class: geosrs:FairgrieveProjection

Table 125 — geosrs:FairgrieveProjection

URI	<a href="https://w3id.org/geosrs/projection/FairgrieveProjection">https://w3id.org/geosrs/projection/FairgrieveProjection</a>
Super-classes	<a href="#">CompromiseProjection</a>

### 11.2.7. Class: geosrs:LarriveeProjection

Table 126 — geosrs:LarriveeProjection

URI	<a href="https://w3id.org/geosrs/projection/LarriveeProjection">https://w3id.org/geosrs/projection/LarriveeProjection</a>
Super-classes	<a href="#">CompromiseProjection</a>

### 11.2.8. Class: geosrs:PetermannStarProjection

Table 127 — geosrs:PetermannStarProjection

URI	<a href="https://w3id.org/geosrs/projection/PetermannStarProjection">https://w3id.org/geosrs/projection/PetermannStarProjection</a>
Super-classes	<a href="#">CompromiseProjection</a>

### 11.2.9. Class: geosrs:SpilhausOceanicProjection

**Table 128** — geosrs:SpilhausOceanicProjection

URI	<a href="https://w3id.org/geosrs/projection/SpilhausOceanicProjection">https://w3id.org/geosrs/projection/SpilhausOceanicProjection</a>
Super-classes	<a href="#">CompromiseProjection</a>

### 11.2.10. Class: geosrs:VanDerGrintenIIIProjection

**Table 129** — geosrs:VanDerGrintenIIIProjection

URI	<a href="https://w3id.org/geosrs/projection/VanDerGrintenIIIProjection">https://w3id.org/geosrs/projection/VanDerGrintenIIIProjection</a>
Super-classes	<a href="#">CompromiseProjection</a>

### 11.2.11. Class: geosrs:WinkelIIIProjection

**Table 130** — geosrs:WinkelIIIProjection

URI	<a href="https://w3id.org/geosrs/projection/WinkelIIIProjection">https://w3id.org/geosrs/projection/WinkelIIIProjection</a>
Super-classes	<a href="#">CompromiseProjection</a>

### 11.2.12. Class: geosrs:WinkelIProjection

**Table 131** — geosrs:WinkelIProjection

URI	<a href="https://w3id.org/geosrs/projection/WinkelIProjection">https://w3id.org/geosrs/projection/WinkelIProjection</a>
Super-classes	<a href="#">CompromiseProjection</a>

### 11.2.13. Class: geosrs:WinkelSnyderProjection

**Table 132** — geosrs:WinkelSnyderProjection

URI	<a href="https://w3id.org/geosrs/projection/WinkelSnyderProjection">https://w3id.org/geosrs/projection/WinkelSnyderProjection</a>
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# 11.3. Conformal Projections

## REQUIREMENT 23: CONFORMAL PROJECTIONS

**IDENTIFIER** /req/Conformal\_Projections

**STATEMENT** Implementations shall allow the RDFS classes geosrs:AdamsProjection, geosrs:AdamsWorldInASquarellProjection, geosrs:AdamsWorldInASquarelProjection, geosrs:AugustEpicycloidalProjection, geosrs:CoxConformalProjection, geosrs:EisenlohrProjection, geosrs:GS50Projection, geosrs:PeirceQuincuncialProjection, geosrs:StereographicProjection to be used in SPARQL graph patterns.

## 11.3.1. Class: geosrs:AdamsProjection

**Table 133** — geosrs:AdamsProjection

URI	<a href="https://w3id.org/geosrs/projection/AdamsProjection">https://w3id.org/geosrs/projection/AdamsProjection</a>
Super-classes	<a href="#">ConformalProjection</a>

## 11.3.2. Class: geosrs:AdamsWorldInASquarellProjection

**Table 134** — geosrs:AdamsWorldInASquarellProjection

URI	<a href="https://w3id.org/geosrs/projection/AdamsWorldInASquarellProjection">https://w3id.org/geosrs/projection/AdamsWorldInASquarellProjection</a>
Super-classes	<a href="#">ConformalProjection</a>

## 11.3.3. Class: geosrs:AdamsWorldInASquarelProjection

**Table 135** — geosrs:AdamsWorldInASquareIProjection

URI	<a href="https://w3id.org/geosrs/projection/AdamsWorldInASquareIProjection">https://w3id.org/geosrs/projection/AdamsWorldInASquareIProjection</a>
Super-classes	<a href="#">ConformalProjection</a>

### 11.3.4. Class: geosrs:AugustEpicycloidalProjection

**Table 136** — geosrs:AugustEpicycloidalProjection

URI	<a href="https://w3id.org/geosrs/projection/AugustEpicycloidalProjection">https://w3id.org/geosrs/projection/AugustEpicycloidalProjection</a>
Definition	A projection in which every angle between two curves that cross each other on a celestial body is preserved in the image of the projection
Super-classes	<a href="#">ConformalProjection</a>

### 11.3.5. Class: geosrs:CoxConformalProjection

**Table 137** — geosrs:CoxConformalProjection

URI	<a href="https://w3id.org/geosrs/projection/CoxConformalProjection">https://w3id.org/geosrs/projection/CoxConformalProjection</a>
Super-classes	<a href="#">ConformalProjection</a>

### 11.3.6. Class: geosrs:EisenlohrProjection

**Table 138** — geosrs:EisenlohrProjection

URI	<a href="https://w3id.org/geosrs/projection/EisenlohrProjection">https://w3id.org/geosrs/projection/EisenlohrProjection</a>
Super-classes	<a href="#">ConformalProjection</a>

### 11.3.7. Class: geosrs:GS50Projection



**Table 139** — geosrs:GS50Projection

URI	<a href="https://w3id.org/geosrs/projection/GS50Projection">https://w3id.org/geosrs/projection/GS50Projection</a>
Super-classes	<a href="#">ConformalProjection</a>

### 11.3.8. Class: geosrs:PeirceQuincuncialProjection

**Table 140** — geosrs:PeirceQuincuncialProjection

URI	<a href="https://w3id.org/geosrs/projection/PeirceQuincuncialProjection">https://w3id.org/geosrs/projection/PeirceQuincuncialProjection</a>
Super-classes	<a href="#">ConformalProjection</a>

### 11.3.9. Class: geosrs:StereographicProjection

**Table 141** — geosrs:StereographicProjection

URI	<a href="https://w3id.org/geosrs/projection/StereographicProjection">https://w3id.org/geosrs/projection/StereographicProjection</a>
Super-classes	<a href="#">ConformalProjection</a>
Example	<a href="#">geosrs:StereographicProjection</a>

## 11.4. Conical Projections

### REQUIREMENT 24: CONICAL PROJECTIONS

**IDENTIFIER**    /req/Conical\_Projections

**STATEMENT**

Implementations shall allow the RDFS classes geosrs:BipolarObliqueConicConformalProjection, geosrs:CentralConicProjection, geosrs:HerschelConformalConicProjection, geosrs:Krovak, geosrs:LambertConformalConicProjection, geosrs:MurdochIIIProjection, geosrs:MurdochIIProjection, geosrs:MurdochIProjection, geosrs:SchjernerIProjection, geosrs:VitkovskyIProjection to be used in SPARQL graph patterns.

### 11.4.1. Class: geosrs:BipolarObliqueConicConformalProjection

Table 142 — geosrs:BipolarObliqueConicConformalProjection

URI	<a href="https://w3id.org/geosrs/projection/BipolarObliqueConicConformalProjection">https://w3id.org/geosrs/projection/BipolarObliqueConicConformalProjection</a>
Super-classes	<a href="#">ConicalProjection</a>

### 11.4.2. Class: geosrs:CentralConicProjection

Table 143 — geosrs:CentralConicProjection

URI	<a href="https://w3id.org/geosrs/projection/CentralConicProjection">https://w3id.org/geosrs/projection/CentralConicProjection</a>
Super-classes	<a href="#">ConicalProjection</a>

### 11.4.3. Class: geosrs:HerschelConformalConicProjection

Table 144 — geosrs:HerschelConformalConicProjection

URI	<a href="https://w3id.org/geosrs/projection/HerschelConformalConicProjection">https://w3id.org/geosrs/projection/HerschelConformalConicProjection</a>
Super-classes	<a href="#">ConicalProjection</a>

### 11.4.4. Class: geosrs:Krovak

Table 145 — geosrs:Krovak

URI	<a href="https://w3id.org/geosrs/projection/Krovak">https://w3id.org/geosrs/projection/Krovak</a>
Super-classes	<a href="#">ConicalProjection</a>
Example	<a href="#">geosrs:Krovak</a>

### 11.4.5. Class: geosrs:LambertConformalConicProjection

**Table 146** — geosrs:LambertConformalConicProjection

URI	<a href="https://w3id.org/geosrs/projection/LambertConformalConicProjection">https://w3id.org/geosrs/projection/LambertConformalConicProjection</a>
Super-classes	<a href="#">ConicalProjection</a>
Example	<a href="#">geosrs:LambertConformalConicProjection</a>

### 11.4.6. Class: geosrs:MurdochIIIProjection

**Table 147** — geosrs:MurdochIIIProjection

URI	<a href="https://w3id.org/geosrs/projection/MurdochIIIProjection">https://w3id.org/geosrs/projection/MurdochIIIProjection</a>
Super-classes	<a href="#">ConicalProjection</a>

### 11.4.7. Class: geosrs:MurdochIIProjection

**Table 148** — geosrs:MurdochIIProjection

URI	<a href="https://w3id.org/geosrs/projection/MurdochIIProjection">https://w3id.org/geosrs/projection/MurdochIIProjection</a>
Super-classes	<a href="#">ConicalProjection</a>

### 11.4.8. Class: geosrs:MurdochIProjection

**Table 149** — geosrs:MurdochIProjection

URI	<a href="https://w3id.org/geosrs/projection/MurdochIProjection">https://w3id.org/geosrs/projection/MurdochIProjection</a>
Super-classes	<a href="#">ConicalProjection</a>

### 11.4.9. Class: geosrs:SchjerningIProjection

Table 150 — geosrs:SchjerningIProjection

URI	<a href="https://w3id.org/geosrs/projection/SchjerningIProjection">https://w3id.org/geosrs/projection/SchjerningIProjection</a>
Super-classes	<a href="#">ConicalProjection</a>

### 11.4.10. Class: geosrs:VitkovskyIProjection

Table 151 — geosrs:VitkovskyIProjection

URI	<a href="https://w3id.org/geosrs/projection/VitkovskyIProjection">https://w3id.org/geosrs/projection/VitkovskyIProjection</a>
Super-classes	<a href="#">ConicalProjection</a>

## 11.5. Cylindrical Projections

### REQUIREMENT 25: CYLINDRICAL PROJECTIONS

IDENTIFIER /req/Cylindrical\_Projections

STATEMENT

Implementations shall allow the RDFS classes geosrs:ArdenCloseProjection, geosrs:BraunPerspectiveProjection, geosrs:CompactMillerProjection, geosrs:CylindricalStereographicProjection, geosrs:KarchenkoShabanovaProjection, geosrs:LabordeProjection, geosrs:MercatorProjection, geosrs:MillerProjection, geosrs:PattersonCylindricalProjection, geosrs:PavlovProjection, geosrs:ToblerCylindricalIIProjection, geosrs:ToblerCylindricalIProjection, geosrs:UrmayevIIIProjection, geosrs:WebMercatorProjection to be used in SPARQL graph patterns.

### 11.5.1. Class: geosrs:ArdenCloseProjection

Table 152 — geosrs:ArdenCloseProjection

URI	<a href="https://w3id.org/geosrs/projection/ArdenCloseProjection">https://w3id.org/geosrs/projection/ArdenCloseProjection</a>
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Super-classes	<a href="#">CylindricalProjection</a>
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### 11.5.2. Class: geosrs:BraunPerspectiveProjection

**Table 153** — geosrs:BraunPerspectiveProjection

URI	<a href="https://w3id.org/geosrs/projection/BraunPerspectiveProjection">https://w3id.org/geosrs/projection/BraunPerspectiveProjection</a>
Super-classes	<a href="#">CylindricalProjection</a>

### 11.5.3. Class: geosrs:CompactMillerProjection

**Table 154** — geosrs:CompactMillerProjection

URI	<a href="https://w3id.org/geosrs/projection/CompactMillerProjection">https://w3id.org/geosrs/projection/CompactMillerProjection</a>
Super-classes	<a href="#">CylindricalProjection</a>

### 11.5.4. Class: geosrs:CylindricalStereographicProjection

**Table 155** — geosrs:CylindricalStereographicProjection

URI	<a href="https://w3id.org/geosrs/projection/CylindricalStereographicProjection">https://w3id.org/geosrs/projection/CylindricalStereographicProjection</a>
Super-classes	<a href="#">CylindricalProjection</a>

### 11.5.5. Class: geosrs:KarchenkoShabanovaProjection

**Table 156** — geosrs:KarchenkoShabanovaProjection

URI	<a href="https://w3id.org/geosrs/projection/KarchenkoShabanovaProjection">https://w3id.org/geosrs/projection/KarchenkoShabanovaProjection</a>
Super-classes	<a href="#">CylindricalProjection</a>

### 11.5.6. Class: geosrs:LabordeProjection

**Table 157** — geosrs:LabordeProjection

URI	<a href="https://w3id.org/geosrs/projection/LabordeProjection">https://w3id.org/geosrs/projection/LabordeProjection</a>
Super-classes	<a href="#">CylindricalProjection</a>
Example	<a href="#">geosrs:LabordeProjection</a>

### 11.5.7. Class: geosrs:MercatorProjection

**Table 158** — geosrs:MercatorProjection

URI	<a href="https://w3id.org/geosrs/projection/MercatorProjection">https://w3id.org/geosrs/projection/MercatorProjection</a>
Super-classes	<a href="#">CylindricalProjection</a>
Example	<a href="#">geosrs:MercatorProjection</a>

### 11.5.8. Class: geosrs:MillerProjection

**Table 159** — geosrs:MillerProjection

URI	<a href="https://w3id.org/geosrs/projection/MillerProjection">https://w3id.org/geosrs/projection/MillerProjection</a>
Super-classes	<a href="#">CylindricalProjection</a>

### 11.5.9. Class: geosrs:PattersonCylindricalProjection

**Table 160** — geosrs:PattersonCylindricalProjection

URI	<a href="https://w3id.org/geosrs/projection/PattersonCylindricalProjection">https://w3id.org/geosrs/projection/PattersonCylindricalProjection</a>
Super-classes	<a href="#">CylindricalProjection</a>

### 11.5.10. Class: geosrs:PavlovProjection

Table 161 — geosrs:PavlovProjection

URI	<a href="https://w3id.org/geosrs/projection/PavlovProjection">https://w3id.org/geosrs/projection/PavlovProjection</a>
Super-classes	<a href="#">CylindricalProjection</a>

### 11.5.11. Class: geosrs:ToblerCylindricalIIIProjection

Table 162 — geosrs:ToblerCylindricalIIIProjection

URI	<a href="https://w3id.org/geosrs/projection/ToblerCylindricalIIIProjection">https://w3id.org/geosrs/projection/ToblerCylindricalIIIProjection</a>
Super-classes	<a href="#">CylindricalProjection</a>

### 11.5.12. Class: geosrs:ToblerCylindricalIIProjection

Table 163 — geosrs:ToblerCylindricalIIProjection

URI	<a href="https://w3id.org/geosrs/projection/ToblerCylindricalIIProjection">https://w3id.org/geosrs/projection/ToblerCylindricalIIProjection</a>
Super-classes	<a href="#">CylindricalProjection</a>

### 11.5.13. Class: geosrs:UrmayevIIIProjection

Table 164 — geosrs:UrmayevIIIProjection

URI	<a href="https://w3id.org/geosrs/projection/UrmayevIIIProjection">https://w3id.org/geosrs/projection/UrmayevIIIProjection</a>
Super-classes	<a href="#">CylindricalProjection</a>

### 11.5.14. Class: geosrs:WebMercatorProjection

**Table 165** — geosrs:WebMercatorProjection

URI	<a href="https://w3id.org/geosrs/projection/WebMercatorProjection">https://w3id.org/geosrs/projection/WebMercatorProjection</a>
Super-classes	<a href="#">CylindricalProjection</a>

## 11.6. Equal Area Projections

### REQUIREMENT 26: EQUAL AREA PROJECTIONS

IDENTIFIER	/req/Equal_Area_Projections
STATEMENT	Implementations shall allow the RDFS classes geosrs:AlbersEqualAreaProjection, geosrs:AzimuthalEqualAreaProjection, geosrs:CylindricalEqualArea, geosrs:GallPetersProjection, geosrs:HoboDyerProjection, geosrs:LambertAzimuthalEqualArea, geosrs:TrystanEdwardsProjection, geosrs:WiechelProjection to be used in SPARQL graph patterns.

#### 11.6.1. Class: geosrs:AlbersEqualAreaProjection

**Table 166** — geosrs:AlbersEqualAreaProjection

URI	<a href="https://w3id.org/geosrs/projection/AlbersEqualAreaProjection">https://w3id.org/geosrs/projection/AlbersEqualAreaProjection</a>
Super-classes	<a href="#">EqualAreaProjection</a>
Example	<code>geosrs:AlbersEqualAreaProjection</code>

#### 11.6.2. Class: geosrs:AzimuthalEqualAreaProjection

**Table 167** — geosrs:AzimuthalEqualAreaProjection

URI	<a href="https://w3id.org/geosrs/projection/AzimuthalEqualAreaProjection">https://w3id.org/geosrs/projection/AzimuthalEqualAreaProjection</a>
Super-classes	<a href="#">EqualAreaProjection</a>



### 11.6.3. Class: geosrs:CylindricalEqualArea

**Table 168** — geosrs:CylindricalEqualArea

URI	<a href="https://w3id.org/geosrs/projection/CylindricalEqualArea">https://w3id.org/geosrs/projection/CylindricalEqualArea</a>
Super-classes	<a href="#">EqualAreaProjection</a>
Example	<a href="#">geosrs:CylindricalEqualArea</a>

### 11.6.4. Class: geosrs:GallPetersProjection

**Table 169** — geosrs:GallPetersProjection

URI	<a href="https://w3id.org/geosrs/projection/GallPetersProjection">https://w3id.org/geosrs/projection/GallPetersProjection</a>
Super-classes	<a href="#">EqualAreaProjection</a>

### 11.6.5. Class: geosrs:HoboDyerProjection

**Table 170** — geosrs:HoboDyerProjection

URI	<a href="https://w3id.org/geosrs/projection/HoboDyerProjection">https://w3id.org/geosrs/projection/HoboDyerProjection</a>
Super-classes	<a href="#">EqualAreaProjection</a>

### 11.6.6. Class: geosrs:LambertAzimuthalEqualArea

**Table 171** — geosrs:LambertAzimuthalEqualArea

URI	<a href="https://w3id.org/geosrs/projection/LambertAzimuthalEqualArea">https://w3id.org/geosrs/projection/LambertAzimuthalEqualArea</a>
Super-classes	<a href="#">EqualAreaProjection</a>

### 11.6.7. Class: geosrs:TrystanEdwardsProjection

Table 172 — geosrs:TrystanEdwardsProjection

URI	<a href="https://w3id.org/geosrs/projection/TrystanEdwardsProjection">https://w3id.org/geosrs/projection/TrystanEdwardsProjection</a>
Super-classes	<a href="#">EqualAreaProjection</a>

### 11.6.8. Class: geosrs:WiechelProjection

Table 173 — geosrs:WiechelProjection

URI	<a href="https://w3id.org/geosrs/projection/WiechelProjection">https://w3id.org/geosrs/projection/WiechelProjection</a>
Super-classes	<a href="#">EqualAreaProjection</a>

## 11.7. Equidistant Projections

### REQUIREMENT 27: EQUIDISTANT PROJECTIONS

**IDENTIFIER** /req/Equidistant\_Projections

**STATEMENT** Implementations shall allow the RDFS classes geosrs:AzimuthalEquidistantProjection, geosrs:BerghausStarProjection, geosrs:CassiniProjection, geosrs:EquidistantConicProjection, geosrs:EquidistantCylindricalProjection, geosrs:EquirectangularProjection, geosrs:ObliquePlateCarreeProjection, geosrs:PlateCarreeProjection, geosrs:TwoPointEquidistantProjection to be used in SPARQL graph patterns.

### 11.7.1. Class: geosrs:AzimuthalEquidistantProjection

Table 174 — geosrs:AzimuthalEquidistantProjection

URI	<a href="https://w3id.org/geosrs/projection/AzimuthalEquidistantProjection">https://w3id.org/geosrs/projection/AzimuthalEquidistantProjection</a>
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Super-classes	<a href="#">EquidistantProjection</a>
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### 11.7.2. Class: geosrs:BerghausStarProjection

**Table 175** — geosrs:BerghausStarProjection

URI	<a href="https://w3id.org/geosrs/projection/BerghausStarProjection">https://w3id.org/geosrs/projection/BerghausStarProjection</a>
Super-classes	<a href="#">EquidistantProjection</a>

### 11.7.3. Class: geosrs:CassiniProjection

**Table 176** — geosrs:CassiniProjection

URI	<a href="https://w3id.org/geosrs/projection/CassiniProjection">https://w3id.org/geosrs/projection/CassiniProjection</a>
Definition	A map projection first described in an approximate form by César-François Cassini de Thury in 1745
Super-classes	<a href="#">EquidistantProjection</a>
Example	<a href="#">geosrs:CassiniProjection</a>

### 11.7.4. Class: geosrs:EquidistantConicProjection

**Table 177** — geosrs:EquidistantConicProjection

URI	<a href="https://w3id.org/geosrs/projection/EquidistantConicProjection">https://w3id.org/geosrs/projection/EquidistantConicProjection</a>
Super-classes	<a href="#">EquidistantProjection</a>

### 11.7.5. Class: geosrs:EquidistantCylindricalProjection

**Table 178** — geosrs:EquidistantCylindricalProjection

URI	<a href="https://w3id.org/geosrs/projection/EquidistantCylindricalProjection">https://w3id.org/geosrs/projection/EquidistantCylindricalProjection</a>
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Super-classes	<a href="#">EquidistantProjection</a>
Example	<a href="#">geosrs:EquidistantCylindricalProjection</a>

### 11.7.6. Class: geosrs:EquirectangularProjection

**Table 179** — geosrs:EquirectangularProjection

URI	<a href="https://w3id.org/geosrs/projection/EquirectangularProjection">https://w3id.org/geosrs/projection/EquirectangularProjection</a>
Super-classes	<a href="#">EquidistantProjection</a>

### 11.7.7. Class: geosrs:ObliquePlateCarreeProjection

**Table 180** — geosrs:ObliquePlateCarreeProjection

URI	<a href="https://w3id.org/geosrs/projection/ObliquePlateCarreeProjection">https://w3id.org/geosrs/projection/ObliquePlateCarreeProjection</a>
Super-classes	<a href="#">EquidistantProjection</a>

### 11.7.8. Class: geosrs:PlateCarreeProjection

**Table 181** — geosrs:PlateCarreeProjection

URI	<a href="https://w3id.org/geosrs/projection/PlateCarreeProjection">https://w3id.org/geosrs/projection/PlateCarreeProjection</a>
Super-classes	<a href="#">EquidistantProjection</a>

### 11.7.9. Class: geosrs:TwoPointEquidistantProjection

**Table 182** — geosrs:TwoPointEquidistantProjection

URI	<a href="https://w3id.org/geosrs/projection/TwoPointEquidistantProjection">https://w3id.org/geosrs/projection/TwoPointEquidistantProjection</a>
Super-classes	<a href="#">EquidistantProjection</a>

# 11.8. Globular Projections

## REQUIREMENT 28: GLOBULAR PROJECTIONS

IDENTIFIER	/req/Globular_Projections
STATEMENT	Implementations shall allow the RDFS classes geosrs:ApianGlobularIProjection, geosrs:BaconGlobularProjection, geosrs:FournierGlobularIProjection to be used in SPARQL graph patterns.

### 11.8.1. Class: geosrs:ApianGlobularIProjection

Table 183 — geosrs:ApianGlobularIProjection

URI	<a href="https://w3id.org/geosrs/projection/ApianGlobularIProjection">https://w3id.org/geosrs/projection/ApianGlobularIProjection</a>
Super-classes	<a href="#">GlobularProjection</a>

### 11.8.2. Class: geosrs:BaconGlobularProjection

Table 184 — geosrs:BaconGlobularProjection

URI	<a href="https://w3id.org/geosrs/projection/BaconGlobularProjection">https://w3id.org/geosrs/projection/BaconGlobularProjection</a>
Super-classes	<a href="#">GlobularProjection</a>

### 11.8.3. Class: geosrs:FournierGlobularIProjection

Table 185 — geosrs:FournierGlobularIProjection

URI	<a href="https://w3id.org/geosrs/projection/FournierGlobularIProjection">https://w3id.org/geosrs/projection/FournierGlobularIProjection</a>
Super-classes	<a href="#">GlobularProjection</a>

# 11.9. Lenticular Projections

Requirement 29: Lenticular Projections	
IDENTIFIER	/req/Lenticular_Projections
STATEMENT	Implementations shall allow the RDFS classes geosrs:A4Projection, geosrs:BriesemeisterProjection, geosrs:CiricIProjection, geosrs:CupolaProjection, geosrs:DedistortProjection, geosrs:DietrichKitadaProjection, geosrs:FranculaIIProjection, geosrs:FranculaIVProjection, geosrs:FranculaIXProjection, geosrs:FranculaVIIIProjection, geosrs:FranculaVProjection, geosrs:FranculaXIIIProjection, geosrs:FranculaXIIProjection, geosrs:FranculaXIVProjection, geosrs:HamusoidalProjection, geosrs:KissProjection to be used in SPARQL graph patterns.

## 11.9.1. Class: geosrs:A4Projection

Table 186 — geosrs:A4Projection

URI	<a href="https://w3id.org/geosrs/projection/A4Projection">https://w3id.org/geosrs/projection/A4Projection</a>
Super-classes	<a href="#">LenticularProjection</a>

## 11.9.2. Class: geosrs:BriesemeisterProjection

Table 187 — geosrs:BriesemeisterProjection

URI	<a href="https://w3id.org/geosrs/projection/BriesemeisterProjection">https://w3id.org/geosrs/projection/BriesemeisterProjection</a>
Super-classes	<a href="#">LenticularProjection</a>

## 11.9.3. Class: geosrs:CiricIProjection

Table 188 — geosrs:CiricIProjection

URI	<a href="https://w3id.org/geosrs/projection/CiricIProjection">https://w3id.org/geosrs/projection/CiricIProjection</a>
Super-classes	<a href="#">LenticularProjection</a>

### 11.9.4. Class: geosrs:CupolaProjection

Table 189 — geosrs:CupolaProjection

URI	<a href="https://w3id.org/geosrs/projection/CupolaProjection">https://w3id.org/geosrs/projection/CupolaProjection</a>
Super-classes	<a href="#">LenticularProjection</a>

### 11.9.5. Class: geosrs:DedistortProjection

Table 190 — geosrs:DedistortProjection

URI	<a href="https://w3id.org/geosrs/projection/DedistortProjection">https://w3id.org/geosrs/projection/DedistortProjection</a>
Super-classes	<a href="#">LenticularProjection</a>

### 11.9.6. Class: geosrs:DietrichKitadaProjection

Table 191 — geosrs:DietrichKitadaProjection

URI	<a href="https://w3id.org/geosrs/projection/DietrichKitadaProjection">https://w3id.org/geosrs/projection/DietrichKitadaProjection</a>
Super-classes	<a href="#">LenticularProjection</a>

### 11.9.7. Class: geosrs:FranculaIIIProjection

Table 192 — geosrs:FranculaIIIProjection

URI	<a href="https://w3id.org/geosrs/projection/FranculaIIIProjection">https://w3id.org/geosrs/projection/FranculaIIIProjection</a>
Super-classes	<a href="#">LenticularProjection</a>

### 11.9.8. Class: geosrs:FranculaIVProjection

**Table 193** — geosrs:FraculaIVProjection

URI	<a href="https://w3id.org/geosrs/projection/FraculaIVProjection">https://w3id.org/geosrs/projection/FraculaIVProjection</a>
Super-classes	<a href="#">LenticularProjection</a>

### 11.9.9. Class: geosrs:FraculaIXProjection

**Table 194** — geosrs:FraculaIXProjection

URI	<a href="https://w3id.org/geosrs/projection/FraculaIXProjection">https://w3id.org/geosrs/projection/FraculaIXProjection</a>
Super-classes	<a href="#">LenticularProjection</a>

### 11.9.10. Class: geosrs:FraculaVIIIProjection

**Table 195** — geosrs:FraculaVIIIProjection

URI	<a href="https://w3id.org/geosrs/projection/FraculaVIIIProjection">https://w3id.org/geosrs/projection/FraculaVIIIProjection</a>
Super-classes	<a href="#">LenticularProjection</a>

### 11.9.11. Class: geosrs:FraculaVProjection

**Table 196** — geosrs:FraculaVProjection

URI	<a href="https://w3id.org/geosrs/projection/FraculaVProjection">https://w3id.org/geosrs/projection/FraculaVProjection</a>
Super-classes	<a href="#">LenticularProjection</a>

### 11.9.12. Class: geosrs:FraculaXIIIProjection

**Table 197** — geosrs:FraculaXIIIProjection

URI	<a href="https://w3id.org/geosrs/projection/FraculaXIIIProjection">https://w3id.org/geosrs/projection/FraculaXIIIProjection</a>
Super-classes	<a href="#">LenticularProjection</a>



### 11.9.13. Class: geosrs:FranculaXIIProjection

**Table 198** — geosrs:FranculaXIIProjection

URI	<a href="https://w3id.org/geosrs/projection/FranculaXIIProjection">https://w3id.org/geosrs/projection/FranculaXIIProjection</a>
Super-classes	<a href="#">LenticularProjection</a>

### 11.9.14. Class: geosrs:FranculaXIVProjection

**Table 199** — geosrs:FranculaXIVProjection

URI	<a href="https://w3id.org/geosrs/projection/FranculaXIVProjection">https://w3id.org/geosrs/projection/FranculaXIVProjection</a>
Super-classes	<a href="#">LenticularProjection</a>

### 11.9.15. Class: geosrs:HamusoidalProjection

**Table 200** — geosrs:HamusoidalProjection

URI	<a href="https://w3id.org/geosrs/projection/HamusoidalProjection">https://w3id.org/geosrs/projection/HamusoidalProjection</a>
Super-classes	<a href="#">LenticularProjection</a>

### 11.9.16. Class: geosrs:KissProjection

**Table 201** — geosrs:KissProjection

URI	<a href="https://w3id.org/geosrs/projection/KissProjection">https://w3id.org/geosrs/projection/KissProjection</a>
Super-classes	<a href="#">LenticularProjection</a>

# 11.10. Minimum Error Projections

Requirement 30: Minimum Error Projections	
IDENTIFIER	/req/Minimum_Error_Projections
STATEMENT	Implementations shall allow the RDFS classes geosrs:AiryProjection to be used in SPARQL graph patterns.

## 11.10.1. Class: geosrs:AiryProjection

Table 202 — geosrs:AiryProjection

URI	<a href="https://w3id.org/geosrs/projection/AiryProjection">https://w3id.org/geosrs/projection/AiryProjection</a>
Definition	An azimuthal minimum error projection for the region within the small or great circle defined by an angular distance, from the tangency point of the plane
Super-classes	<a href="#">MinimumErrorProjection</a>

# 11.11. Perspective Projections

Requirement 31: Perspective Projections	
IDENTIFIER	/req/Perspective_Projections
STATEMENT	Implementations shall allow the RDFS classes geosrs:CentralCylindricalProjection, geosrs:GeneralVerticalPerspectiveProjection, geosrs:GilbertTwoWorldPerspectiveProjection, geosrs:LaHireProjection, geosrs:LorgnaProjection, geosrs:LowryProjection, geosrs:OrthographicProjection, geosrs:PerspectiveConicProjection, geosrs:TiltedPerspectiveProjection, geosrs:VerticalPerspectiveProjection to be used in SPARQL graph patterns.

## 11.11.1. Class: geosrs:CentralCylindricalProjection

**Table 203** — geosrs:CentralCylindricalProjection

URI	<a href="https://w3id.org/geosrs/projection/CentralCylindricalProjection">https://w3id.org/geosrs/projection/CentralCylindricalProjection</a>
Super-classes	<a href="#">PerspectiveProjection</a>

### 11.11.2. Class: geosrs:GeneralVerticalPerspectiveProjection

**Table 204** — geosrs:GeneralVerticalPerspectiveProjection

URI	<a href="https://w3id.org/geosrs/projection/GeneralVerticalPerspectiveProjection">https://w3id.org/geosrs/projection/GeneralVerticalPerspectiveProjection</a>
Super-classes	<a href="#">PerspectiveProjection</a>

### 11.11.3. Class: geosrs:GilbertTwoWorldPerspectiveProjection

**Table 205** — geosrs:GilbertTwoWorldPerspectiveProjection

URI	<a href="https://w3id.org/geosrs/projection/GilbertTwoWorldPerspectiveProjection">https://w3id.org/geosrs/projection/GilbertTwoWorldPerspectiveProjection</a>
Super-classes	<a href="#">PerspectiveProjection</a>

### 11.11.4. Class: geosrs:LaHireProjection

**Table 206** — geosrs:LaHireProjection

URI	<a href="https://w3id.org/geosrs/projection/LaHireProjection">https://w3id.org/geosrs/projection/LaHireProjection</a>
Super-classes	<a href="#">PerspectiveProjection</a>

### 11.11.5. Class: geosrs:LorgnaProjection

**Table 207** — geosrs:LorgnaProjection

URI	<a href="https://w3id.org/geosrs/projection/LorgnaProjection">https://w3id.org/geosrs/projection/LorgnaProjection</a>
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Super-classes	<a href="#"><u>PerspectiveProjection</u></a>
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### 11.11.6. Class: geosrs:LowryProjection

**Table 208** — geosrs:LowryProjection

URI	<a href="https://w3id.org/geosrs/projection/LowryProjection"><u>https://w3id.org/geosrs/projection/LowryProjection</u></a>
Super-classes	<a href="#"><u>PerspectiveProjection</u></a>

### 11.11.7. Class: geosrs:OrthographicProjection

**Table 209** — geosrs:OrthographicProjection

URI	<a href="https://w3id.org/geosrs/projection/OrthographicProjection"><u>https://w3id.org/geosrs/projection/OrthographicProjection</u></a>
Super-classes	<a href="#"><u>PerspectiveProjection</u></a>

### 11.11.8. Class: geosrs:PerspectiveConicProjection

**Table 210** — geosrs:PerspectiveConicProjection

URI	<a href="https://w3id.org/geosrs/projection/PerspectiveConicProjection"><u>https://w3id.org/geosrs/projection/PerspectiveConicProjection</u></a>
Super-classes	<a href="#"><u>PerspectiveProjection</u></a>

### 11.11.9. Class: geosrs:TiltedPerspectiveProjection

**Table 211** — geosrs:TiltedPerspectiveProjection

URI	<a href="https://w3id.org/geosrs/projection/TiltedPerspectiveProjection"><u>https://w3id.org/geosrs/projection/TiltedPerspectiveProjection</u></a>
Super-classes	<a href="#"><u>PerspectiveProjection</u></a>

### 11.11.10. Class: geosrs:VerticalPerspectiveProjection

Table 212 — geosrs:VerticalPerspectiveProjection

URI	<a href="https://w3id.org/geosrs/projection/VerticalPerspectiveProjection">https://w3id.org/geosrs/projection/VerticalPerspectiveProjection</a>
Super-classes	<a href="#">PerspectiveProjection</a>

## 11.12. Polyconic Projections

### REQUIREMENT 32: POLYCONIC PROJECTIONS

**IDENTIFIER** /req/Polyconic\_Projections

**STATEMENT** Implementations shall allow the RDFS classes geosrs:GinzburgIVProjection, geosrs:GinzburgIXProjection, geosrs:GinzburgVIPProjection, geosrs:GinzburgVProjection, geosrs:GottWagnerProjection, geosrs:HillEucyclicProjection, geosrs:LagrangeProjection, geosrs:LaskowskiProjection, geosrs:RectangularPolyconicProjection, geosrs:StabiusWernerIIIProjection, geosrs:StabiusWernerIProjection, geosrs:VanDerGrintenIIProjection, geosrs:VanDerGrintenIProjection, geosrs:VanDerGrintenIVProjection, geosrs:WagnerIXProjection, geosrs:WagnerVIIIProjection, geosrs:WagnerVIIProjection to be used in SPARQL graph patterns.

### 11.12.1. Class: geosrs:GinzburgIVProjection

Table 213 — geosrs:GinzburgIVProjection

URI	<a href="https://w3id.org/geosrs/projection/GinzburgIVProjection">https://w3id.org/geosrs/projection/GinzburgIVProjection</a>
Super-classes	<a href="#">PolyconicProjection</a>

### 11.12.2. Class: geosrs:GinzburgIXProjection

Table 214 — geosrs:GinzburgIXProjection

URI	<a href="https://w3id.org/geosrs/projection/GinzburgIXProjection">https://w3id.org/geosrs/projection/GinzburgIXProjection</a>
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Super-classes	<a href="#">PolyconicProjection</a>
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### 11.12.3. Class: geosrs:GinzburgVIProjection

**Table 215** — geosrs:GinzburgVIProjection

URI	<a href="https://w3id.org/geosrs/projection/GinzburgVIProjection">https://w3id.org/geosrs/projection/GinzburgVIProjection</a>
Super-classes	<a href="#">PolyconicProjection</a>

### 11.12.4. Class: geosrs:GinzburgVProjection

**Table 216** — geosrs:GinzburgVProjection

URI	<a href="https://w3id.org/geosrs/projection/GinzburgVProjection">https://w3id.org/geosrs/projection/GinzburgVProjection</a>
Super-classes	<a href="#">PolyconicProjection</a>

### 11.12.5. Class: geosrs:GottWagnerProjection

**Table 217** — geosrs:GottWagnerProjection

URI	<a href="https://w3id.org/geosrs/projection/GottWagnerProjection">https://w3id.org/geosrs/projection/GottWagnerProjection</a>
Super-classes	<a href="#">PolyconicProjection</a>

### 11.12.6. Class: geosrs:HillEucyclicProjection

**Table 218** — geosrs:HillEucyclicProjection

URI	<a href="https://w3id.org/geosrs/projection/HillEucyclicProjection">https://w3id.org/geosrs/projection/HillEucyclicProjection</a>
Super-classes	<a href="#">PolyconicProjection</a>

### 11.12.7. Class: geosrs:LagrangeProjection

Table 219 — geosrs:LagrangeProjection

URI	<a href="https://w3id.org/geosrs/projection/LagrangeProjection">https://w3id.org/geosrs/projection/LagrangeProjection</a>
Super-classes	<a href="#">PolyconicProjection</a>

### 11.12.8. Class: geosrs:LaskowskiProjection

Table 220 — geosrs:LaskowskiProjection

URI	<a href="https://w3id.org/geosrs/projection/LaskowskiProjection">https://w3id.org/geosrs/projection/LaskowskiProjection</a>
Super-classes	<a href="#">PolyconicProjection</a>

### 11.12.9. Class: geosrs:RectangularPolyconicProjection

Table 221 — geosrs:RectangularPolyconicProjection

URI	<a href="https://w3id.org/geosrs/projection/RectangularPolyconicProjection">https://w3id.org/geosrs/projection/RectangularPolyconicProjection</a>
Super-classes	<a href="#">PolyconicProjection</a>

### 11.12.10. Class: geosrs:StabiusWernerIIIProjection

Table 222 — geosrs:StabiusWernerIIIProjection

URI	<a href="https://w3id.org/geosrs/projection/StabiusWernerIIIProjection">https://w3id.org/geosrs/projection/StabiusWernerIIIProjection</a>
Super-classes	<a href="#">PolyconicProjection</a>

### 11.12.11. Class: geosrs:StabiusWernerIProjection

**Table 223** — geosrs:StabiusWernerIProjection

URI	<a href="https://w3id.org/geosrs/projection/StabiusWernerIProjection">https://w3id.org/geosrs/projection/StabiusWernerIProjection</a>
Super-classes	<a href="#">PolyconicProjection</a>

### 11.12.12. Class: geosrs:VanDerGrintenIIProjection

**Table 224** — geosrs:VanDerGrintenIIProjection

URI	<a href="https://w3id.org/geosrs/projection/VanDerGrintenIIProjection">https://w3id.org/geosrs/projection/VanDerGrintenIIProjection</a>
Super-classes	<a href="#">PolyconicProjection</a>

### 11.12.13. Class: geosrs:VanDerGrintenIProjection

**Table 225** — geosrs:VanDerGrintenIProjection

URI	<a href="https://w3id.org/geosrs/projection/VanDerGrintenIProjection">https://w3id.org/geosrs/projection/VanDerGrintenIProjection</a>
Super-classes	<a href="#">PolyconicProjection</a>

### 11.12.14. Class: geosrs:VanDerGrintenIVProjection

**Table 226** — geosrs:VanDerGrintenIVProjection

URI	<a href="https://w3id.org/geosrs/projection/VanDerGrintenIVProjection">https://w3id.org/geosrs/projection/VanDerGrintenIVProjection</a>
Super-classes	<a href="#">PolyconicProjection</a>

### 11.12.15. Class: geosrs:WagnerIXProjection

**Table 227** — geosrs:WagnerIXProjection

URI	<a href="https://w3id.org/geosrs/projection/WagnerIXProjection">https://w3id.org/geosrs/projection/WagnerIXProjection</a>
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Super-classes	<a href="#">PolyconicProjection</a>
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### 11.12.16. Class: geosrs:WagnerVIIIProjection

Table 228 — geosrs:WagnerVIIIProjection

URI	<a href="https://w3id.org/geosrs/projection/WagnerVIIIProjection">https://w3id.org/geosrs/projection/WagnerVIIIProjection</a>
Super-classes	<a href="#">PolyconicProjection</a>

### 11.12.17. Class: geosrs:WagnerVIIProjection

Table 229 — geosrs:WagnerVIIProjection

URI	<a href="https://w3id.org/geosrs/projection/WagnerVIIProjection">https://w3id.org/geosrs/projection/WagnerVIIProjection</a>
Super-classes	<a href="#">PolyconicProjection</a>

## 11.13. Polyhedral Projections

REQUIREMENT 33: POLYHEDRAL PROJECTIONS	
IDENTIFIER	/req/Polyhedral_Projections
STATEMENT	Implementations shall allow the RDFS classes geosrs:AuthaGraphProjection, geosrs:CahillKeyesProjection, geosrs:CollignonButterflyProjection, geosrs:DodecahedralProjection, geosrs:DymaxionProjection, geosrs:GnomonicButterflyProjection, geosrs:GnomonicCubedSphereProjection, geosrs:GnomonicIcosahedronProjection, geosrs:GuyouProjection, geosrs:IcosahedralProjection, geosrs:LeeProjection, geosrs:MyrahedalProjection, geosrs:OctantProjection, geosrs:QuadrilateralizedSphericalCubeProjection, geosrs:WatermanButterflyProjection to be used in SPARQL graph patterns.

### 11.13.1. Class: geosrs:AuthaGraphProjection

**Table 230** — geosrs:AuthaGraphProjection

URI	<a href="https://w3id.org/geosrs/projection/AuthaGraphProjection">https://w3id.org/geosrs/projection/AuthaGraphProjection</a>
Super-classes	<a href="#">PolyhedralProjection</a>

### 11.13.2. Class: geosrs:CahillKeyesProjection

**Table 231** — geosrs:CahillKeyesProjection

URI	<a href="https://w3id.org/geosrs/projection/CahillKeyesProjection">https://w3id.org/geosrs/projection/CahillKeyesProjection</a>
Super-classes	<a href="#">PolyhedralProjection</a>

### 11.13.3. Class: geosrs:CollignonButterflyProjection

**Table 232** — geosrs:CollignonButterflyProjection

URI	<a href="https://w3id.org/geosrs/projection/CollignonButterflyProjection">https://w3id.org/geosrs/projection/CollignonButterflyProjection</a>
Super-classes	<a href="#">PolyhedralProjection</a>

### 11.13.4. Class: geosrs:DodecahedralProjection

**Table 233** — geosrs:DodecahedralProjection

URI	<a href="https://w3id.org/geosrs/projection/DodecahedralProjection">https://w3id.org/geosrs/projection/DodecahedralProjection</a>
Super-classes	<a href="#">PolyhedralProjection</a>

### 11.13.5. Class: geosrs:DymaxionProjection

**Table 234** — geosrs:DymaxionProjection

URI	<a href="https://w3id.org/geosrs/projection/DymaxionProjection">https://w3id.org/geosrs/projection/DymaxionProjection</a>
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Super-classes	<a href="#">PolyhedralProjection</a>
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### 11.13.6. Class: geosrs:GnomonicButterflyProjection

**Table 235** — geosrs:GnomonicButterflyProjection

URI	<a href="https://w3id.org/geosrs/projection/GnomonicButterflyProjection">https://w3id.org/geosrs/projection/GnomonicButterflyProjection</a>
Super-classes	<a href="#">PolyhedralProjection</a>

### 11.13.7. Class: geosrs:GnomonicCubedSphereProjection

**Table 236** — geosrs:GnomonicCubedSphereProjection

URI	<a href="https://w3id.org/geosrs/projection/GnomonicCubedSphereProjection">https://w3id.org/geosrs/projection/GnomonicCubedSphereProjection</a>
Super-classes	<a href="#">PolyhedralProjection</a>

### 11.13.8. Class: geosrs:GnomonicIcosahedronProjection

**Table 237** — geosrs:GnomonicIcosahedronProjection

URI	<a href="https://w3id.org/geosrs/projection/GnomonicIcosahedronProjection">https://w3id.org/geosrs/projection/GnomonicIcosahedronProjection</a>
Super-classes	<a href="#">PolyhedralProjection</a>

### 11.13.9. Class: geosrs:GuyouProjection

**Table 238** — geosrs:GuyouProjection

URI	<a href="https://w3id.org/geosrs/projection/GuyouProjection">https://w3id.org/geosrs/projection/GuyouProjection</a>
Super-classes	<a href="#">PolyhedralProjection</a>

### 11.13.10. Class: geosrs:IcosahedralProjection

Table 239 — geosrs:IcosahedralProjection

URI	<a href="https://w3id.org/geosrs/projection/IcosahedralProjection">https://w3id.org/geosrs/projection/IcosahedralProjection</a>
Super-classes	<a href="#">PolyhedralProjection</a>

### 11.13.11. Class: geosrs:LeeProjection

Table 240 — geosrs:LeeProjection

URI	<a href="https://w3id.org/geosrs/projection/LeeProjection">https://w3id.org/geosrs/projection/LeeProjection</a>
Super-classes	<a href="#">PolyhedralProjection</a>

### 11.13.12. Class: geosrs:MyrahedralProjection

Table 241 — geosrs:MyrahedralProjection

URI	<a href="https://w3id.org/geosrs/projection/MyrahedralProjection">https://w3id.org/geosrs/projection/MyrahedralProjection</a>
Super-classes	<a href="#">PolyhedralProjection</a>

### 11.13.13. Class: geosrs:OctantProjection

Table 242 — geosrs:OctantProjection

URI	<a href="https://w3id.org/geosrs/projection/OctantProjection">https://w3id.org/geosrs/projection/OctantProjection</a>
Super-classes	<a href="#">PolyhedralProjection</a>

### 11.13.14. Class: geosrs:QuadrilateralizedSphericalCubeProjection

**Table 243** — geosrs:QuadrilateralizedSphericalCubeProjection

URI	<a href="https://w3id.org/geosrs/projection/QuadrilateralizedSphericalCubeProjection">https://w3id.org/geosrs/projection/QuadrilateralizedSphericalCubeProjection</a>
Super-classes	<a href="#">PolyhedralProjection</a>

### 11.13.15. Class: geosrs:WatermanButterflyProjection

**Table 244** — geosrs:WatermanButterflyProjection

URI	<a href="https://w3id.org/geosrs/projection/WatermanButterflyProjection">https://w3id.org/geosrs/projection/WatermanButterflyProjection</a>
Super-classes	<a href="#">PolyhedralProjection</a>

## 11.14. Pseudo Azimuthal Projections

### REQUIREMENT 34: PSEUDO AZIMUTHAL PROJECTIONS

IDENTIFIER	/req/Pseudo_Azimuthal_Projections
STATEMENT	Implementations shall allow the RDFS classes geosrs:AitoffObliqueProjection, geosrs:AitoffProjection, geosrs:HammerProjection, geosrs:Strebe1995Projection, geosrs:WinkelTripelProjection to be used in SPARQL graph patterns.

### 11.14.1. Class: geosrs:AitoffObliqueProjection

**Table 245** — geosrs:AitoffObliqueProjection

URI	<a href="https://w3id.org/geosrs/projection/AitoffObliqueProjection">https://w3id.org/geosrs/projection/AitoffObliqueProjection</a>
Super-classes	<a href="#">PseudoAzimuthalProjection</a>

### 11.14.2. Class: geosrs:AitoffProjection

**Table 246** — geosrs:AitoffProjection

URI	<a href="https://w3id.org/geosrs/projection/AitoffProjection">https://w3id.org/geosrs/projection/AitoffProjection</a>
Definition	A modified azimuthal projection whose graticule takes the form of an ellipse
Super-classes	<a href="#">PseudoAzimuthalProjection</a>

### 11.14.3. Class: geosrs:HammerProjection

**Table 247** — geosrs:HammerProjection

URI	<a href="https://w3id.org/geosrs/projection/HammerProjection">https://w3id.org/geosrs/projection/HammerProjection</a>
Super-classes	<a href="#">PseudoAzimuthalProjection</a>

### 11.14.4. Class: geosrs:Strebe1995Projection

**Table 248** — geosrs:Strebe1995Projection

URI	<a href="https://w3id.org/geosrs/projection/Strebe1995Projection">https://w3id.org/geosrs/projection/Strebe1995Projection</a>
Super-classes	<a href="#">PseudoAzimuthalProjection</a>

### 11.14.5. Class: geosrs:WinkelTripelProjection

**Table 249** — geosrs:WinkelTripelProjection

URI	<a href="https://w3id.org/geosrs/projection/WinkelTripelProjection">https://w3id.org/geosrs/projection/WinkelTripelProjection</a>
Super-classes	<a href="#">PseudoAzimuthalProjection</a>

## 11.15. Pseudo Conical Projections

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## REQUIREMENT 35: PSEUDO CONICAL PROJECTIONS

IDENTIFIER	/req/Pseudo_Conical_Projections
STATEMENT	Implementations shall allow the RDFS classes <code>geosrs:AmericanPolyconicProjection</code> , <code>geosrs:BonneProjection</code> , <code>geosrs:BottomleyProjection</code> , <code>geosrs:NicolosiGlobularProjection</code> , <code>geosrs:PtolemyIIProjection</code> , <code>geosrs:WernerProjection</code> to be used in SPARQL graph patterns.

### 11.15.1. Class: `geosrs:AmericanPolyconicProjection`

Table 250 — `geosrs:AmericanPolyconicProjection`

URI	<a href="https://w3id.org/geosrs/projection/AmericanPolyconicProjection">https://w3id.org/geosrs/projection/AmericanPolyconicProjection</a>
Super-classes	<a href="#">PseudoConicalProjection</a>
Example	<a href="#">geosrs:AmericanPolyconicProjection</a>

### 11.15.2. Class: `geosrs:BonneProjection`

Table 251 — `geosrs:BonneProjection`

URI	<a href="https://w3id.org/geosrs/projection/BonneProjection">https://w3id.org/geosrs/projection/BonneProjection</a>
Super-classes	<a href="#">PseudoConicalProjection</a>

### 11.15.3. Class: `geosrs:BottomleyProjection`

Table 252 — `geosrs:BottomleyProjection`

URI	<a href="https://w3id.org/geosrs/projection/BottomleyProjection">https://w3id.org/geosrs/projection/BottomleyProjection</a>
Super-classes	<a href="#">PseudoConicalProjection</a>

### 11.15.4. Class: `geosrs:NicolosiGlobularProjection`

**Table 253** — geosrs:NicolosiGlobularProjection

URI	<a href="https://w3id.org/geosrs/projection/NicolosiGlobularProjection">https://w3id.org/geosrs/projection/NicolosiGlobularProjection</a>
Super-classes	<a href="#">PseudoConicalProjection</a>

**11.15.5. Class: geosrs:PtolemyIIProjection**

**Table 254** — geosrs:PtolemyIIProjection

URI	<a href="https://w3id.org/geosrs/projection/PtolemyIIProjection">https://w3id.org/geosrs/projection/PtolemyIIProjection</a>
Super-classes	<a href="#">PseudoConicalProjection</a>

**11.15.6. Class: geosrs:WernerProjection**

**Table 255** — geosrs:WernerProjection

URI	<a href="https://w3id.org/geosrs/projection/WernerProjection">https://w3id.org/geosrs/projection/WernerProjection</a>
Super-classes	<a href="#">PseudoConicalProjection</a>

**11.16. Pseudo Cylindrical Projections**

REQUIREMENT 36: PSEUDO CYLINDRICAL PROJECTIONS	
IDENTIFIER	/req/Pseudo_Cylindrical_Projections
STATEMENT	Implementations shall allow the RDFS classes geosrs:ApianIIProjection, geosrs:AtlantisProjection, geosrs:BaranyIIIIProjection, geosrs:BaranyIIProjection, geosrs:BaranyIProjection, geosrs:BaranyIIVProjection, geosrs:BoggsEumorphicProjection, geosrs:BromleyProjection, geosrs:CabotProjection, geosrs:CollignonProjection, geosrs:CrasterParabolicProjection, geosrs:DeakinMinimumErrorProjection, geosrs:Eckert1Projection, geosrs:Eckert2Projection, geosrs:Eckert3Projection, geosrs:Eckert4Projection, geosrs:Eckert5Projection, geosrs:Eckert6Projection, geosrs:EqualEarthProjection, geosrs:FaheyProjection, geosrs:FoucautProjection, geosrs:FoucautSinusoidalProjection, geosrs:FournierIIProjection, geosrs:GinzburgVIIIProjection, geosrs:GoodeHomolosineProjection, geosrs:HEALPixProjection, geosrs:HufnagelProjection, geosrs:Kavrayskiy7Projection, geosrs:LoximuthalProjection, geosrs:MayrProjection, geosrs:McBrydeThomasFlatPolarParabolicProjection,



## REQUIREMENT 36: PSEUDO CYLINDRICAL PROJECTIONS

geosrs:McBrydeThomasFlatPolarQuarticProjection, geosrs:McBrydeThomasFlatPolarSinusoidalProjection, geosrs:McBrydeThomasIIProjection, geosrs:McBrydeThomasIProjection, geosrs:NaturalEarth2Projection, geosrs:NaturalEarthProjection, geosrs:NellHammerProjection, geosrs:NellProjection, geosrs:OrteliusOvalProjection, geosrs:PutninsP1Projection, geosrs:PutninsP2Projection, geosrs:PutninsP3Projection, geosrs:PutninsP5Projection, geosrs:PutninsP6Projection, geosrs:QuarticAuthalicProjection, geosrs:RobinsonProjection, geosrs:SinusoidalProjection, geosrs:TheTimesProjection, geosrs:ToblerG1Projection, geosrs:ToblerHyperellipticalProjection, geosrs:WagnerIIIProjection, geosrs:WagnerIIProjection, geosrs:WagnerIProjection, geosrs:WagnerIVProjection, geosrs:WagnerVProjection, geosrs:WagnerVProjection, geosrs:WerenskioldIProjection, geosrs:PutninsP3'Projection, geosrs:PutninsP4'Projection, geosrs:PutninsP5'Projection, geosrs:PutninsP6'Projection to be used in SPARQL graph patterns.

### 11.16.1. Class: geosrs:ApianIIProjection

Table 256 — geosrs:ApianIIProjection

URI	<a href="https://w3id.org/geosrs/projection/ApianIIProjection">https://w3id.org/geosrs/projection/ApianIIProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.16.2. Class: geosrs:AtlantisProjection

Table 257 — geosrs:AtlantisProjection

URI	<a href="https://w3id.org/geosrs/projection/AtlantisProjection">https://w3id.org/geosrs/projection/AtlantisProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.16.3. Class: geosrs:BaranyIIIProjection

Table 258 — geosrs:BaranyIIIProjection

URI	<a href="https://w3id.org/geosrs/projection/BaranyIIIProjection">https://w3id.org/geosrs/projection/BaranyIIIProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

#### 11.16.4. Class: geosrs:BaranyillProjection

Table 259 — geosrs:BaranyillProjection

URI	<a href="https://w3id.org/geosrs/projection/BaranyillProjection">https://w3id.org/geosrs/projection/BaranyillProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

#### 11.16.5. Class: geosrs:BaranyilProjection

Table 260 — geosrs:BaranyilProjection

URI	<a href="https://w3id.org/geosrs/projection/BaranyilProjection">https://w3id.org/geosrs/projection/BaranyilProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

#### 11.16.6. Class: geosrs:BaranyilVProjection

Table 261 — geosrs:BaranyilVProjection

URI	<a href="https://w3id.org/geosrs/projection/BaranyilVProjection">https://w3id.org/geosrs/projection/BaranyilVProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

#### 11.16.7. Class: geosrs:BoggsEumorphicProjection

Table 262 — geosrs:BoggsEumorphicProjection

URI	<a href="https://w3id.org/geosrs/projection/BoggsEumorphicProjection">https://w3id.org/geosrs/projection/BoggsEumorphicProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

#### 11.16.8. Class: geosrs:BromleyProjection

**Table 263** — geosrs:BromleyProjection

URI	<a href="https://w3id.org/geosrs/projection/BromleyProjection">https://w3id.org/geosrs/projection/BromleyProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.16.9. Class: geosrs:CabotProjection

**Table 264** — geosrs:CabotProjection

URI	<a href="https://w3id.org/geosrs/projection/CabotProjection">https://w3id.org/geosrs/projection/CabotProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.16.10. Class: geosrs:CollignonProjection

**Table 265** — geosrs:CollignonProjection

URI	<a href="https://w3id.org/geosrs/projection/CollignonProjection">https://w3id.org/geosrs/projection/CollignonProjection</a>
Definition	An equal-area pseudocylindrical projection that maps the sphere onto a triangle or diamond
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.16.11. Class: geosrs:CrasterParabolicProjection

**Table 266** — geosrs:CrasterParabolicProjection

URI	<a href="https://w3id.org/geosrs/projection/CrasterParabolicProjection">https://w3id.org/geosrs/projection/CrasterParabolicProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.16.12. Class: geosrs:DeakinMinimumErrorProjection

**Table 267** — geosrs:DeakinMinimumErrorProjection

URI	<a href="https://w3id.org/geosrs/projection/DeakinMinimumErrorProjection">https://w3id.org/geosrs/projection/DeakinMinimumErrorProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.16.13. Class: geosrs:Eckert1Projection

**Table 268** — geosrs:Eckert1Projection

URI	<a href="https://w3id.org/geosrs/projection/Eckert1Projection">https://w3id.org/geosrs/projection/Eckert1Projection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.16.14. Class: geosrs:Eckert2Projection

**Table 269** — geosrs:Eckert2Projection

URI	<a href="https://w3id.org/geosrs/projection/Eckert2Projection">https://w3id.org/geosrs/projection/Eckert2Projection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.16.15. Class: geosrs:Eckert3Projection

**Table 270** — geosrs:Eckert3Projection

URI	<a href="https://w3id.org/geosrs/projection/Eckert3Projection">https://w3id.org/geosrs/projection/Eckert3Projection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.16.16. Class: geosrs:Eckert4Projection

**Table 271** — geosrs:Eckert4Projection

URI	<a href="https://w3id.org/geosrs/projection/Eckert4Projection">https://w3id.org/geosrs/projection/Eckert4Projection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.16.17. Class: geosrs:Eckert5Projection

Table 272 — geosrs:Eckert5Projection

URI	<a href="https://w3id.org/geosrs/projection/Eckert5Projection">https://w3id.org/geosrs/projection/Eckert5Projection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.16.18. Class: geosrs:Eckert6Projection

Table 273 — geosrs:Eckert6Projection

URI	<a href="https://w3id.org/geosrs/projection/Eckert6Projection">https://w3id.org/geosrs/projection/Eckert6Projection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.16.19. Class: geosrs:EqualEarthProjection

Table 274 — geosrs:EqualEarthProjection

URI	<a href="https://w3id.org/geosrs/projection/EqualEarthProjection">https://w3id.org/geosrs/projection/EqualEarthProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>
Example	<a href="#">geosrs:EqualEarthProjection</a>

### 11.16.20. Class: geosrs:FaheyProjection

Table 275 — geosrs:FaheyProjection

URI	<a href="https://w3id.org/geosrs/projection/FaheyProjection">https://w3id.org/geosrs/projection/FaheyProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.16.21. Class: geosrs:FoucautProjection

Table 276 — geosrs:FoucautProjection

URI	<a href="https://w3id.org/geosrs/projection/FoucautProjection">https://w3id.org/geosrs/projection/FoucautProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.16.22. Class: geosrs:FoucautSinusoidalProjection

Table 277 — geosrs:FoucautSinusoidalProjection

URI	<a href="https://w3id.org/geosrs/projection/FoucautSinusoidalProjection">https://w3id.org/geosrs/projection/FoucautSinusoidalProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.16.23. Class: geosrs:FournierIIProjection

Table 278 — geosrs:FournierIIProjection

URI	<a href="https://w3id.org/geosrs/projection/FournierIIProjection">https://w3id.org/geosrs/projection/FournierIIProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.16.24. Class: geosrs:GinzburgVIIIProjection

Table 279 — geosrs:GinzburgVIIIProjection

URI	<a href="https://w3id.org/geosrs/projection/GinzburgVIIIProjection">https://w3id.org/geosrs/projection/GinzburgVIIIProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.16.25. Class: geosrs:GoodeHomolosineProjection

**Table 280** — geosrs:GoodeHomolosineProjection

URI	<a href="https://w3id.org/geosrs/projection/GoodeHomolosineProjection">https://w3id.org/geosrs/projection/GoodeHomolosineProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.16.26. Class: geosrs:HEALPixProjection

**Table 281** — geosrs:HEALPixProjection

URI	<a href="https://w3id.org/geosrs/projection/HEALPixProjection">https://w3id.org/geosrs/projection/HEALPixProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.16.27. Class: geosrs:HufnagelProjection

**Table 282** — geosrs:HufnagelProjection

URI	<a href="https://w3id.org/geosrs/projection/HufnagelProjection">https://w3id.org/geosrs/projection/HufnagelProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.16.28. Class: geosrs:Kavrayskiy7Projection

**Table 283** — geosrs:Kavrayskiy7Projection

URI	<a href="https://w3id.org/geosrs/projection/Kavrayskiy7Projection">https://w3id.org/geosrs/projection/Kavrayskiy7Projection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.16.29. Class: geosrs:LoximuthalProjection

**Table 284** — geosrs:LoximuthalProjection

URI	<a href="https://w3id.org/geosrs/projection/LoximuthalProjection">https://w3id.org/geosrs/projection/LoximuthalProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.16.30. Class: geosrs:MayrProjection

Table 285 — geosrs:MayrProjection

URI	<a href="https://w3id.org/geosrs/projection/MayrProjection">https://w3id.org/geosrs/projection/MayrProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.16.31. Class: geosrs:McBrydeThomasFlatPolarParabolicProjection

Table 286 — geosrs:McBrydeThomasFlatPolarParabolicProjection

URI	<a href="https://w3id.org/geosrs/projection/McBrydeThomasFlatPolarParabolicProjection">https://w3id.org/geosrs/projection/McBrydeThomasFlatPolarParabolicProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.16.32. Class: geosrs:McBrydeThomasFlatPolarQuarticProjection

Table 287 — geosrs:McBrydeThomasFlatPolarQuarticProjection

URI	<a href="https://w3id.org/geosrs/projection/McBrydeThomasFlatPolarQuarticProjection">https://w3id.org/geosrs/projection/McBrydeThomasFlatPolarQuarticProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.16.33. Class: geosrs:McBrydeThomasFlatPolarSinusoidalProjection

Table 288 — geosrs:McBrydeThomasFlatPolarSinusoidalProjection

URI	<a href="https://w3id.org/geosrs/projection/McBrydeThomasFlatPolarSinusoidalProjection">https://w3id.org/geosrs/projection/McBrydeThomasFlatPolarSinusoidalProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.16.34. Class: geosrs:McBrydeThomasIIProjection



**Table 289** — geosrs:McBrydeThomasIIProjection

URI	<a href="https://w3id.org/geosrs/projection/McBrydeThomasIIProjection">https://w3id.org/geosrs/projection/McBrydeThomasIIProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.16.35. Class: geosrs:McBrydeThomasIProjection

**Table 290** — geosrs:McBrydeThomasIProjection

URI	<a href="https://w3id.org/geosrs/projection/McBrydeThomasIProjection">https://w3id.org/geosrs/projection/McBrydeThomasIProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.16.36. Class: geosrs:NaturalEarth2Projection

**Table 291** — geosrs:NaturalEarth2Projection

URI	<a href="https://w3id.org/geosrs/projection/NaturalEarth2Projection">https://w3id.org/geosrs/projection/NaturalEarth2Projection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.16.37. Class: geosrs:NaturalEarthProjection

**Table 292** — geosrs:NaturalEarthProjection

URI	<a href="https://w3id.org/geosrs/projection/NaturalEarthProjection">https://w3id.org/geosrs/projection/NaturalEarthProjection</a>
Definition	A pseudocylindrical map projection designed by Tom Patterson and introduced in 2008
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.16.38. Class: geosrs:NellHammerProjection

**Table 293** — geosrs:NellHammerProjection

URI	<a href="https://w3id.org/geosrs/projection/NellHammerProjection">https://w3id.org/geosrs/projection/NellHammerProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.16.39. Class: geosrs:NellProjection

**Table 294** — geosrs:NellProjection

URI	<a href="https://w3id.org/geosrs/projection/NellProjection">https://w3id.org/geosrs/projection/NellProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.16.40. Class: geosrs:OrteliusOvalProjection

**Table 295** — geosrs:OrteliusOvalProjection

URI	<a href="https://w3id.org/geosrs/projection/OrteliusOvalProjection">https://w3id.org/geosrs/projection/OrteliusOvalProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.16.41. Class: geosrs:PutninsP1Projection

**Table 296** — geosrs:PutninsP1Projection

URI	<a href="https://w3id.org/geosrs/projection/PutninsP1Projection">https://w3id.org/geosrs/projection/PutninsP1Projection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.16.42. Class: geosrs:PutninsP2Projection

**Table 297** — geosrs:PutninsP2Projection

URI	<a href="https://w3id.org/geosrs/projection/PutninsP2Projection">https://w3id.org/geosrs/projection/PutninsP2Projection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.16.43. Class: geosrs:PutninsP3Projection

Table 298 — geosrs:PutninsP3Projection

URI	<a href="https://w3id.org/geosrs/projection/PutninsP3Projection">https://w3id.org/geosrs/projection/PutninsP3Projection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.16.44. Class: geosrs:PutninsP5Projection

Table 299 — geosrs:PutninsP5Projection

URI	<a href="https://w3id.org/geosrs/projection/PutninsP5Projection">https://w3id.org/geosrs/projection/PutninsP5Projection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.16.45. Class: geosrs:PutninsP6Projection

Table 300 — geosrs:PutninsP6Projection

URI	<a href="https://w3id.org/geosrs/projection/PutninsP6Projection">https://w3id.org/geosrs/projection/PutninsP6Projection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.16.46. Class: geosrs:QuarticAuthalicProjection

Table 301 — geosrs:QuarticAuthalicProjection

URI	<a href="https://w3id.org/geosrs/projection/QuarticAuthalicProjection">https://w3id.org/geosrs/projection/QuarticAuthalicProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.16.47. Class: geosrs:RobinsonProjection

**Table 302** — geosrs:RobinsonProjection

URI	<a href="https://w3id.org/geosrs/projection/RobinsonProjection">https://w3id.org/geosrs/projection/RobinsonProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.16.48. Class: geosrs:SinusoidalProjection

**Table 303** — geosrs:SinusoidalProjection

URI	<a href="https://w3id.org/geosrs/projection/SinusoidalProjection">https://w3id.org/geosrs/projection/SinusoidalProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.16.49. Class: geosrs:TheTimesProjection

**Table 304** — geosrs:TheTimesProjection

URI	<a href="https://w3id.org/geosrs/projection/TheTimesProjection">https://w3id.org/geosrs/projection/TheTimesProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.16.50. Class: geosrs:ToblerG1Projection

**Table 305** — geosrs:ToblerG1Projection

URI	<a href="https://w3id.org/geosrs/projection/ToblerG1Projection">https://w3id.org/geosrs/projection/ToblerG1Projection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.16.51. Class: geosrs:ToblerHyperellipticalProjection

**Table 306** — geosrs:ToblerHyperellipticalProjection

URI	<a href="https://w3id.org/geosrs/projection/ToblerHyperellipticalProjection">https://w3id.org/geosrs/projection/ToblerHyperellipticalProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.16.52. Class: geosrs:WagnerIIIProjection

Table 307 — geosrs:WagnerIIIProjection

URI	<a href="https://w3id.org/geosrs/projection/WagnerIIIProjection">https://w3id.org/geosrs/projection/WagnerIIIProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.16.53. Class: geosrs:WagnerIIProjection

Table 308 — geosrs:WagnerIIProjection

URI	<a href="https://w3id.org/geosrs/projection/WagnerIIProjection">https://w3id.org/geosrs/projection/WagnerIIProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.16.54. Class: geosrs:WagnerIProjection

Table 309 — geosrs:WagnerIProjection

URI	<a href="https://w3id.org/geosrs/projection/WagnerIProjection">https://w3id.org/geosrs/projection/WagnerIProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.16.55. Class: geosrs:WagnerIVProjection

Table 310 — geosrs:WagnerIVProjection

URI	<a href="https://w3id.org/geosrs/projection/WagnerIVProjection">https://w3id.org/geosrs/projection/WagnerIVProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.16.56. Class: geosrs:WagnerVProjection

**Table 311** — geosrs:WagnerVIProjection

URI	<a href="https://w3id.org/geosrs/projection/WagnerVIProjection">https://w3id.org/geosrs/projection/WagnerVIProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.16.57. Class: geosrs:WagnerVProjection

**Table 312** — geosrs:WagnerVProjection

URI	<a href="https://w3id.org/geosrs/projection/WagnerVProjection">https://w3id.org/geosrs/projection/WagnerVProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.16.58. Class: geosrs:WerenskioldIProjection

**Table 313** — geosrs:WerenskioldIProjection

URI	<a href="https://w3id.org/geosrs/projection/WerenskioldIProjection">https://w3id.org/geosrs/projection/WerenskioldIProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.16.59. Class: geosrs:PutninsP3'Projection

**Table 314** — geosrs:PutninsP3'Projection

URI	<a href="https://w3id.org/geosrs/projection/PutninsP3'Projection">https://w3id.org/geosrs/projection/PutninsP3'Projection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.16.60. Class: geosrs:PutninsP4'Projection

**Table 315** — geosrs:PutninsP4'Projection

URI	<a href="https://w3id.org/geosrs/projection/PutninsP4'Projection">https://w3id.org/geosrs/projection/PutninsP4'Projection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.16.61. Class: geosrs:PutninsP5'Projection

Table 316 — geosrs:PutninsP5'Projection

URI	<a href="https://w3id.org/geosrs/projection/PutninsP5'Projection">https://w3id.org/geosrs/projection/PutninsP5'Projection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.16.62. Class: geosrs:PutninsP6'Projection

Table 317 — geosrs:PutninsP6'Projection

URI	<a href="https://w3id.org/geosrs/projection/PutninsP6'Projection">https://w3id.org/geosrs/projection/PutninsP6'Projection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

## 11.17. Stereographic Projections

### REQUIREMENT 37: STEREOGRAPHIC PROJECTIONS

IDENTIFIER	/req/Stereographic_Projections
STATEMENT	Implementations shall allow the RDFS classes geosrs:MillerOblatedStereographicProjection, geosrs:RoussilheProjection to be used in SPARQL graph patterns.

### 11.17.1. Class: geosrs:MillerOblatedStereographicProjection

Table 318 — geosrs:MillerOblatedStereographicProjection

URI	<a href="https://w3id.org/geosrs/projection/MillerOblatedStereographicProjection">https://w3id.org/geosrs/projection/MillerOblatedStereographicProjection</a>
Super-classes	<a href="#">StereographicProjection</a>

# 11.17.2. Class: geosrs:RoussilheProjection

Table 319 — geosrs:RoussilheProjection

URI	<a href="https://w3id.org/geosrs/projection/RoussilheProjection">https://w3id.org/geosrs/projection/RoussilheProjection</a>
Super-classes	<a href="#">StereographicProjection</a>



12

# PLANET MODULE

---

This clause establishes the **PLANET** Requirements class, with IRI `/req/planet`, which has a corresponding Conformance Class, **PLANET**, with IRI `/conf/planet`.

#### REQUIREMENTS CLASS 7: 12-PLANET\_MODULE.ADOC EXTENSION

IDENTIFIER	<code>/req/12-planet_module.adoc</code>
TARGET TYPE	Implementation Specification
REQUIREMENT	<code>/req/Interstellar_Body</code>

## 12.1. Interstellar Body

#### REQUIREMENT 38: INTERSTELLAR BODY

IDENTIFIER	<code>/req/Interstellar_Body</code>
STATEMENT	Implementations shall allow the RDFS classes <code>geosrs:ArtificialSatellite</code> , <code>geosrs:Asteroid</code> , <code>geosrs:Comet</code> , <code>geosrs:DwarfPlanet</code> , <code>geosrs:InterstellarBody</code> , <code>geosrs:Moon</code> , <code>geosrs:NaturalSatellite</code> , <code>geosrs:Planet</code> , <code>geosrs:PlanetStatus</code> , <code>geosrs:Plutoid</code> , <code>geosrs:Star</code> to be used in SPARQL graph patterns.

### 12.1.1. Class: `geosrs:ArtificialSatellite`

Table 320 — `geosrs:ArtificialSatellite`

URI	<a href="https://w3id.org/geosrs/planet/ArtificialSatellite">https://w3id.org/geosrs/planet/ArtificialSatellite</a>
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### 12.1.2. Class: `geosrs:Asteroid`

Table 321 — `geosrs:Asteroid`

URI	<a href="https://w3id.org/geosrs/planet/Asteroid">https://w3id.org/geosrs/planet/Asteroid</a>
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### 12.1.3. Class: geosrs:Comet

Table 322 — geosrs:Comet

URI	<a href="https://w3id.org/geosrs/planet/Comet">https://w3id.org/geosrs/planet/Comet</a>
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### 12.1.4. Class: geosrs:DwarfPlanet

Table 323 — geosrs:DwarfPlanet

URI	<a href="https://w3id.org/geosrs/planet/DwarfPlanet">https://w3id.org/geosrs/planet/DwarfPlanet</a>
-----	---

### 12.1.5. Class: geosrs:InterstellarBody

Table 324 — geosrs:InterstellarBody

URI	<a href="https://w3id.org/geosrs/planet/InterstellarBody">https://w3id.org/geosrs/planet/InterstellarBody</a>
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### 12.1.6. Class: geosrs:Moon

Table 325 — geosrs:Moon

URI	<a href="https://w3id.org/geosrs/planet/Moon">https://w3id.org/geosrs/planet/Moon</a>
-----	---

### 12.1.7. Class: geosrs:NaturalSatellite

Table 326 — geosrs:NaturalSatellite

URI	<a href="https://w3id.org/geosrs/planet/NaturalSatellite">https://w3id.org/geosrs/planet/NaturalSatellite</a>
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### 12.1.8. Class: geosrs:Planet

**Table 327** — geosrs:Planet

URI	<a href="https://w3id.org/geosrs/planet/Planet">https://w3id.org/geosrs/planet/Planet</a>
-----	---

### 12.1.9. Class: geosrs:PlanetStatus

**Table 328** — geosrs:PlanetStatus

URI	<a href="https://w3id.org/geosrs/planet/PlanetStatus">https://w3id.org/geosrs/planet/PlanetStatus</a>
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### 12.1.10. Class: geosrs:Plutoid

**Table 329** — geosrs:Plutoid

URI	<a href="https://w3id.org/geosrs/planet/Plutoid">https://w3id.org/geosrs/planet/Plutoid</a>
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### 12.1.11. Class: geosrs:Star

**Table 330** — geosrs:Star

URI	<a href="https://w3id.org/geosrs/planet/Star">https://w3id.org/geosrs/planet/Star</a>
-----	---



13

# COMMON INSTANCES

---

This clause establishes common instances which are needed in CRS specifications as Requirement class **INSTANCES**, with IRI `/req/instances`, which has a corresponding Conformance Class, **INSTANCES**, with IRI `/conf/instances`.

#### REQUIREMENTS CLASS 8: 13-INSTANCES.ADOC EXTENSION

IDENTIFIER	<code>/req/13-instances.adoc</code>
TARGET TYPE	Implementation Specification
REQUIREMENT	<code>/req/Coordinate_System_Axis</code>
	<code>/req/Spheroids</code>

### 13.1. Coordinate System Axis

#### REQUIREMENT 39: COORDINATE SYSTEM AXIS

IDENTIFIER	<code>/req/Coordinate_System_Axis</code>
STATEMENT	Implementations shall allow the RDFS instances <code>geosrs:down</code> , <code>geosrs:east</code> , <code>geosrs:north</code> , <code>geosrs:south</code> , <code>geosrs:up</code> , <code>geosrs:west</code> to be used in SPARQL graph patterns.

#### 13.1.1. Instance: `geosrs:down`

Table 331 — `geosrs:down`

URI	<a href="https://w3id.org/geosrs/down">https://w3id.org/geosrs/down</a>
Type	<a href="#"><code>geosrs:AxisDirection</code></a>
Definition	Downwards axis direction

### 13.1.2. Instance: geosrs:east

**Table 332** — geosrs:east

URI	<a href="https://w3id.org/geosrs/east">https://w3id.org/geosrs/east</a>
Type	<a href="#">geosrs:AxisDirection</a>
Definition	east axis direction

### 13.1.3. Instance: geosrs:north

**Table 333** — geosrs:north

URI	<a href="https://w3id.org/geosrs/north">https://w3id.org/geosrs/north</a>
Type	<a href="#">geosrs:AxisDirection</a>
Definition	North axis direction

### 13.1.4. Instance: geosrs:south

**Table 334** — geosrs:south

URI	<a href="https://w3id.org/geosrs/south">https://w3id.org/geosrs/south</a>
Type	<a href="#">geosrs:AxisDirection</a>
Definition	South axis direction

### 13.1.5. Instance: geosrs:up

**Table 335** — geosrs:up

URI	<a href="https://w3id.org/geosrs/up">https://w3id.org/geosrs/up</a>
-----	---

Type	<a href="#">geosrs:AxisDirection</a>
Definition	Up axis direction

### 13.1.6. Instance: geosrs:west

**Table 336** — geosrs:west

URI	<a href="https://w3id.org/geosrs/west">https://w3id.org/geosrs/west</a>
Type	<a href="#">geosrs:AxisDirection</a>
Definition	West axis direction

## 13.2. Spheroids

### REQUIREMENT 40: SPHEROIDS

**IDENTIFIER** /req/Spheroids

**STATEMENT** Implementations shall allow the RDFS instances geosrs:GRS1980, geosrs:GRS67, geosrs:PZ90, geosrs:Airy1830, geosrs:AiryModified1849, geosrs:International1924, geosrs:AustralianNationalSpheroid, geosrs:Everest1930, geosrs:Clarke1866, geosrs:Plessis1817, geosrs:Danish1876, geosrs:Struve1860, geosrs:IAG1975, geosrs:Clarke1858, geosrs:Clarke1880, geosrs:Helmert1906, geosrs:CGCS2000, geosrs:GSK-2011, geosrs:Zach1812, geosrs:Clarke1880ARC, geosrs:Clarke1880IGN, geosrs:WGS66, geosrs:WGS72, geosrs:WGS84, geosrs:Krassowsky1940 to be used in SPARQL graph patterns.

### 13.2.1. Instance: geosrs:GRS1980

**Table 337** — geosrs:GRS1980

URI	<a href="https://w3id.org/geosrs/GRS1980">https://w3id.org/geosrs/GRS1980</a>
Type	<a href="#">geosrs:Ellipsoid</a>
Definition	GRS 1980 Ellipsoid



Example	<a href="https://w3id.org/geosrs/GRS1980">geosrs:GRS1980</a>
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### 13.2.2. Instance: geosrs:GRS67

**Table 338** — geosrs:GRS67

URI	<a href="https://w3id.org/geosrs/GRS67">https://w3id.org/geosrs/GRS67</a>
Type	<a href="https://w3id.org/geosrs/Ellipsoid">geosrs:Ellipsoid</a>
Definition	GRS 67 Ellipsoid
Example	<a href="https://w3id.org/geosrs/GRS67">geosrs:GRS67</a>

### 13.2.3. Instance: geosrs:PZ90

**Table 339** — geosrs:PZ90

URI	<a href="https://w3id.org/geosrs/PZ90">https://w3id.org/geosrs/PZ90</a>
Type	<a href="https://w3id.org/geosrs/Ellipsoid">geosrs:Ellipsoid</a>
Definition	PZ 90 Ellipsoid
Example	<a href="https://w3id.org/geosrs/PZ90">geosrs:PZ90</a>

### 13.2.4. Instance: geosrs:Airy1830

**Table 340** — geosrs:Airy1830

URI	<a href="https://w3id.org/geosrs/Airy1830">https://w3id.org/geosrs/Airy1830</a>
Type	<a href="https://w3id.org/geosrs/Ellipsoid">geosrs:Ellipsoid</a>
Definition	Airy 1830 Ellipsoid
Example	<a href="https://w3id.org/geosrs/Airy1830">geosrs:Airy1830</a>

### 13.2.5. Instance: geosrs:AiryModified1849

**Table 341** — geosrs:AiryModified1849

URI	<a href="https://w3id.org/geosrs/AiryModified1849">https://w3id.org/geosrs/AiryModified1849</a>
Type	<a href="#">geosrs:Ellipsoid</a>
Definition	Airy 1849 Modified Ellipsoid
Example	<a href="#">geosrs:AiryModified1849</a>

### 13.2.6. Instance: geosrs:International1924

**Table 342** — geosrs:International1924

URI	<a href="https://w3id.org/geosrs/International1924">https://w3id.org/geosrs/International1924</a>
Type	<a href="#">geosrs:Ellipsoid</a>
Definition	International 1924 Ellipsoid
Example	<a href="#">geosrs:International1924</a>

### 13.2.7. Instance: geosrs:AustralianNationalSpheroid

**Table 343** — geosrs:AustralianNationalSpheroid

URI	<a href="https://w3id.org/geosrs/AustralianNationalSpheroid">https://w3id.org/geosrs/AustralianNationalSpheroid</a>
Type	<a href="#">geosrs:Ellipsoid</a>
Definition	Australian National Spheroid
Example	<a href="#">geosrs:AustralianNationalSpheroid</a>

### 13.2.8. Instance: geosrs:Everest1930

**Table 344** — geosrs:Everest1930

URI	<a href="https://w3id.org/geosrs/Everest1930">https://w3id.org/geosrs/Everest1930</a>
Type	<a href="#">geosrs:Ellipsoid</a>
Definition	Everest 1930 Spheroid

### 13.2.9. Instance: geosrs:Clarke1866

**Table 345** — geosrs:Clarke1866

URI	<a href="https://w3id.org/geosrs/Clarke1866">https://w3id.org/geosrs/Clarke1866</a>
Type	<a href="#">geosrs:Ellipsoid</a>
Definition	Clarke 1866 Spheroid
Example	<a href="#">geosrs:Clarke1866</a>

### 13.2.10. Instance: geosrs:Plessis1817

**Table 346** — geosrs:Plessis1817

URI	<a href="https://w3id.org/geosrs/Plessis1817">https://w3id.org/geosrs/Plessis1817</a>
Type	<a href="#">geosrs:Ellipsoid</a>
Definition	Plessis 1817 Spheroid
Example	<a href="#">geosrs:Plessis1817</a>

### 13.2.11. Instance: geosrs:Danish1876

**Table 347** — geosrs:Danish1876

URI	<a href="https://w3id.org/geosrs/Danish1876">https://w3id.org/geosrs/Danish1876</a>
Type	<a href="#">geosrs:Ellipsoid</a>
Definition	Danish 1876 Spheroid
Example	<a href="#">geosrs:Danish1876</a>

### 13.2.12. Instance: geosrs:Struve1860

**Table 348** — geosrs:Struve1860

URI	<a href="https://w3id.org/geosrs/Struve1860">https://w3id.org/geosrs/Struve1860</a>
Type	<a href="#">geosrs:Ellipsoid</a>
Definition	Struve 1860 Spheroid
Example	<a href="#">geosrs:Struve1860</a>

### 13.2.13. Instance: geosrs:IAG1975

**Table 349** — geosrs:IAG1975

URI	<a href="https://w3id.org/geosrs/IAG1975">https://w3id.org/geosrs/IAG1975</a>
Type	<a href="#">geosrs:Ellipsoid</a>
Definition	IAG 1975 Spheroid
Example	<a href="#">geosrs:IAG1975</a>

### 13.2.14. Instance: geosrs:Clarke1858

**Table 350** — geosrs:Clarke1858

URI	<a href="https://w3id.org/geosrs/Clarke1858">https://w3id.org/geosrs/Clarke1858</a>
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Type	<a href="#">geosrs:Ellipsoid</a>
Definition	Clarke 1858 Spheroid
Example	<a href="#">geosrs:Clarke1858</a>

### 13.2.15. Instance: geosrs:Clarke1880

**Table 351** — geosrs:Clarke1880

URI	<a href="https://w3id.org/geosrs/Clarke1880">https://w3id.org/geosrs/Clarke1880</a>
Type	<a href="#">geosrs:Ellipsoid</a>
Definition	Clarke 1880 Spheroid
Example	<a href="#">geosrs:Clarke1880</a>

### 13.2.16. Instance: geosrs:Helmert1906

**Table 352** — geosrs:Helmert1906

URI	<a href="https://w3id.org/geosrs/Helmert1906">https://w3id.org/geosrs/Helmert1906</a>
Type	<a href="#">geosrs:Ellipsoid</a>
Definition	Helmert 1906 Spheroid
Example	<a href="#">geosrs:Helmert1906</a>

### 13.2.17. Instance: geosrs:CGCS2000

**Table 353** — geosrs:CGCS2000

URI	<a href="https://w3id.org/geosrs/CGCS2000">https://w3id.org/geosrs/CGCS2000</a>
Type	<a href="#">geosrs:Ellipsoid</a>

Definition	CGCS2000 Spheroid
Example	<a href="#">geosrs:CGCS2000</a>

### 13.2.18. Instance: geosrs:GSK-2011

**Table 354** — geosrs:GSK-2011

URI	<a href="https://w3id.org/geosrs/GSK-2011">https://w3id.org/geosrs/GSK-2011</a>
Type	<a href="#">geosrs:Ellipsoid</a>
Definition	GSK-2011 Spheroid

### 13.2.19. Instance: geosrs:Zach1812

**Table 355** — geosrs:Zach1812

URI	<a href="https://w3id.org/geosrs/Zach1812">https://w3id.org/geosrs/Zach1812</a>
Type	<a href="#">geosrs:Ellipsoid</a>
Definition	Zach 1812 Spheroid
Example	<a href="#">geosrs:Zach1812</a>

### 13.2.20. Instance: geosrs:Clarke1880ARC

**Table 356** — geosrs:Clarke1880ARC

URI	<a href="https://w3id.org/geosrs/Clarke1880ARC">https://w3id.org/geosrs/Clarke1880ARC</a>
Type	<a href="#">geosrs:Ellipsoid</a>
Definition	Clarke 1880 (Arc) Spheroid
Example	<a href="#">geosrs:Clarke1880ARC</a>

### 13.2.21. Instance: geosrs:Clarke1880IGN

**Table 357** — geosrs:Clarke1880IGN

URI	<a href="https://w3id.org/geosrs/Clarke1880IGN">https://w3id.org/geosrs/Clarke1880IGN</a>
Type	<a href="#">geosrs:Ellipsoid</a>
Definition	Clarke 1880 (Ing) Spheroid
Example	<a href="#">geosrs:Clarke1880IGN</a>

### 13.2.22. Instance: geosrs:WGS66

**Table 358** — geosrs:WGS66

URI	<a href="https://w3id.org/geosrs/WGS66">https://w3id.org/geosrs/WGS66</a>
Type	<a href="#">geosrs:Ellipsoid</a>
Definition	WGS 66 Spheroid

### 13.2.23. Instance: geosrs:WGS72

**Table 359** — geosrs:WGS72

URI	<a href="https://w3id.org/geosrs/WGS72">https://w3id.org/geosrs/WGS72</a>
Type	<a href="#">geosrs:Ellipsoid</a>
Definition	WGS 72 Spheroid
Example	<a href="#">geosrs:WGS72</a>

### 13.2.24. Instance: geosrs:WGS84

**Table 360** — geosrs:WGS84

URI	<a href="https://w3id.org/geosrs/WGS84">https://w3id.org/geosrs/WGS84</a>
Type	<a href="#">geosrs:Ellipsoid</a>
Definition	WGS 84 Spheroid
Example	<a href="#">geosrs:WGS84</a>

### 13.2.25. Instance: geosrs:Krassowsky1940

**Table 361** — geosrs:Krassowsky1940

URI	<a href="https://w3id.org/geosrs/Krassowsky1940">https://w3id.org/geosrs/Krassowsky1940</a>
Type	<a href="#">geosrs:Ellipsoid</a>
Definition	Krassowsky 1940 Spheroid
Example	<a href="#">geosrs:Krassowsky1940</a>

















# ANNEX A (INFORMATIVE) ALIGNMENTS

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# ANNEX A (INFORMATIVE) ALIGNMENTS

## Overview

## Overview

The prefixes used for the ontologies mapped to in all following sections are given in the following table.

**Table A.1** — Alignment: Namespaces

ign:	<a href="http://data.ign.fr/def/ignf#">http://data.ign.fr/def/ignf#</a>
iso19111:	<a href="http://def.isotc211.org/iso19112/2019/SpatialReferencingByGeographicIdentifier#">http://def.isotc211.org/iso19112/2019/SpatialReferencingByGeographicIdentifier#</a>
geosrs:	<a href="http://www.opengis.net/ont/geosparql#">http://www.opengis.net/ont/geosparql#</a>
ifc:	<a href="https://standards.buildingsmart.org/IFC/DEV/IFC4/ADD2_TC1/OWL/">https://standards.buildingsmart.org/IFC/DEV/IFC4/ADD2_TC1/OWL/</a>
owl:	<a href="http://www.w3.org/2002/07/owl#">http://www.w3.org/2002/07/owl#</a>
prov:	<a href="http://www.w3.org/ns/prov#">http://www.w3.org/ns/prov#</a>
rdf:	<a href="http://www.w3.org/1999/02/22-rdf-syntax-ns#">http://www.w3.org/1999/02/22-rdf-syntax-ns#</a>
rdfs:	<a href="http://www.w3.org/2000/01/rdf-schema#">http://www.w3.org/2000/01/rdf-schema#</a>

## A.1. IGN Ontology



**Table A.2 – Alignment: IGN Ontology**

FROM ELEMENT	MAPPING RELATION	TO ELEMENT	NOTES
<a href="#">geosrs:CoordinateSystem</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:CoordinateSystem</a>	-
<a href="#">geosrs:Datum</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:Datum</a>	-
<a href="#">geosrs:Ellipsoid</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:Ellipsoid</a>	-
<a href="#">geosrs:Conversion</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:Conversion</a>	-
<a href="#">geosrs:CoordinateOperation</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:CoordinateOperation</a>	-
<a href="#">geosrs:OperationMethod</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:OperationMethod</a>	-
<a href="#">geosrs:OperationParameter</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:OperationParameter</a>	-
<a href="#">geosrs:OperationParameterValue</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:OperationParameterValue</a>	-
<a href="#">geosrs:SingleOperation</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:SingleOperation</a>	-
<a href="#">geosrs:Transformation</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:Transformation</a>	-
<a href="#">geosrs:CartesianCoordinateSystem</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:CartesianCS</a>	-
<a href="#">geosrs:CoordinateSystem</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:CoordinateSystem</a>	-
<a href="#">geosrs:CoordinateSystemAxis</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:CoordinateSystemAxis</a>	-
<a href="#">geosrs:EllipsoidalCoordinateSystem</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:EllipsoidalCS</a>	-
<a href="#">geosrs:VerticalCoordinateSystem</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:VerticalCS</a>	-
<a href="#">geosrs:Datum</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:Datum</a>	-
<a href="#">geosrs:Ellipsoid</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:Ellipsoid</a>	-
<a href="#">geosrs:GeodeticDatum</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:GeodeticDatum</a>	-
<a href="#">geosrs:PrimeMeridian</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:PrimeMeridian</a>	-
<a href="#">geosrs:VerticalDatum</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:VerticalDatum</a>	-
<a href="#">geosrs:AxesList</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:AxesList</a>	-

FROM ELEMENT	MAPPING RELATION	TO ELEMENT	NOTES
<a href="#">geosrs:CRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:CRS</a>	-
<a href="#">geosrs:CompoundCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:CompoundCRS</a>	-
<a href="#">geosrs:Extent</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:Extent</a>	-
<a href="#">geosrs:GeodeticCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:GeodeticCRS</a>	-
<a href="#">geosrs:GeographicBoundingBox</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:GeographicBoundingBox</a>	-
<a href="#">geosrs:ProjectedCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:ProjectedCRS</a>	-
<a href="#">geosrs:SingleCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:SingleCRS</a>	-
<a href="#">geosrs:SingleCRSList</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:SingleCRSList</a>	-
<a href="#">geosrs:VerticalCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:VerticalCRS</a>	-

## A.2. ISO19111 Ontology

**Table A.3** – Alignment: ISO19111 Ontology

FROM ELEMENT	MAPPING RELATION	TO ELEMENT	NOTES
<a href="#">geosrs:CoordinateSystem</a>	<a href="#">owl:equivalentClass</a>	<a href="#">iso19111:CoordinateSystem</a>	-
<a href="#">geosrs:Datum</a>	<a href="#">owl:equivalentClass</a>	<a href="#">iso19111:Datum</a>	-
<a href="#">geosrs:Ellipsoid</a>	<a href="#">owl:equivalentClass</a>	<a href="#">iso19111:Ellipsoid</a>	-
<a href="#">geosrs:CRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">iso19111:CRS</a>	-
<a href="#">geosrs:CompoundCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">iso19111:CompoundCRS</a>	-
<a href="#">geosrs:EngineeringCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">iso19111:EngineeringCRS</a>	-
<a href="#">geosrs:GeodeticCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">iso19111:GeodeticCRS</a>	-

FROM ELEMENT	MAPPING RELATION	TO ELEMENT	NOTES
<a href="#">geosrs:GeographicCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">iso19111:GeographicCRS</a>	-
<a href="#">geosrs:ParametricCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">iso19111:ParametricCRS</a>	-
<a href="#">geosrs:ProjectedCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">iso19111:ProjectedCRS</a>	-
<a href="#">geosrs:SingleCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">iso19111:SingleCRS</a>	-
<a href="#">geosrs:TemporalCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">iso19111:TemporalCRS</a>	-
<a href="#">geosrs:VerticalCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">iso19111:VerticalCRS</a>	-

## A.3. IFC Ontology

**Table A.4** – Alignment: IFC Ontology

FROM ELEMENT	MAPPING RELATION	TO ELEMENT	NOTES
<a href="#">geosrs:AxisDirection</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ifc:IfcDirection</a>	-
<a href="#">geosrs:CRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ifc:IfcCoordinateReferenceSystem</a>	-
<a href="#">geosrs:CoordinateOperation</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ifc:IfcCoordinateOperation</a>	-
<a href="#">geosrs:ProjectedCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ifc:IfcProjectedCRS</a>	-
<a href="#">geosrs:axis</a>	<a href="#">owl:equivalentProperty</a>	<a href="#">ifc:axis_IfcAxis1Placement</a>	-
<a href="#">geosrs:sourceCRS</a>	<a href="#">owl:equivalentProperty</a>	<a href="#">ifc:sourceCRS</a>	-
<a href="#">geosrs:targetCRS</a>	<a href="#">owl:equivalentProperty</a>	<a href="#">ifc:targetCRS</a>	-



# ANNEX B (INFORMATIVE) SHACL SHAPES

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## ANNEX B (INFORMATIVE) SHACL SHAPES

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Overview

### Overview

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# ANNEX C (INFORMATIVE) REVISION HISTORY

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## ANNEX C (INFORMATIVE) REVISION HISTORY

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DATE	RELEASE	AUTHOR	PRIMARY CLAUSES MODIFIED	DESCRIPTION
2016-04-28	0.1	G. Editor	all	initial version



# BIBLIOGRAPHY







## BIBLIOGRAPHY

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**NOTE:** The TC has approved Springer LNCS as the official document citation type. Springer LNCS is widely used in technical and computer science journals and other publications. For citations in the text please use square brackets and consecutive numbers: [1], [2], [3]. Actual References: [n] Journal: Author Surname, A.: Title. Publication Title. Volume number, Issue number, Pages Used (Year Published)

- [1] ISO: ISO 19142, *Geographic information – Web Feature Service*. International Organization for Standardization, Geneva <https://www.iso.org/standard/42136.html>.
- [2] W3C: **Data Catalog Vocabulary**, W3C Recommendation 16 January 2014, <https://www.w3.org/TR/vocab-dcat/>
- [3] IANA: **Link Relation Types**, <https://www.iana.org/assignments/link-relations/link-relations.xml>
- [4] W3C/OGC: **Spatial Data on the Web Best Practices**, W3C Working Group Note 28 September 2017, <https://www.w3.org/TR/sdw-bp/>
- [5] W3C: **Data on the Web Best Practices**, W3C Recommendation 31 January 2017, <https://www.w3.org/TR/dwbp/>
- [6] Ben-Kiki, O., Evans, C., Ingy döt Net: **YAML Ain't Markup Language**, <https://yaml.org/>
- [7] OGC: **Web Feature Service 2.0**, <http://docs.opengeospatial.org/is/09-025r2/09-025r2.html>
- [8] Berners-Lee, T., Fielding, R., Masinter, L.: **IETF RFC 3986 – Uniform Resource Identifier (URI): Generic Syntax**, <http://tools.ietf.org/rfc/rfc3986.txt>