

# OGC® DOCUMENT: 18-053R2

External identifier of this OGC® document: <http://www.opengis.net/docs/CS/3DTiles/1.0>



Open  
Geospatial  
Consortium

# OGC DOCUMENT TITLE

COMMUNITY STANDARD

APPROVED

**Version:** 1.0

**Submission Date:** 2018-06-04

**Approval Date:** 2018-12-14

**Publication Date:** 2019-01-31

**Editor:** Patrick Cozzi, Sean Lilley

**Notice:** This document is an OGC Member approved international standard. This document is available on a royalty free, non-discriminatory basis. Recipients of this document are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

### License Agreement

Use of this document is subject to the license agreement at <https://www.ogc.org/license>

### Copyright notice

Copyright © 2025 Open Geospatial Consortium

To obtain additional rights of use, visit <https://www.ogc.org/legal>

### Note

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. The Open Geospatial Consortium shall not be held responsible for identifying any or all such patent rights.

Recipients of this document are requested to submit, with their comments, notification of any relevant patent claims or other intellectual property rights of which they may be aware that might be infringed by any implementation of the standard set forth in this document, and to provide supporting documentation.

# CONTENTS

I. ABSTRACT .....	xvii
II. KEYWORDS .....	xvii
III. PREFACE .....	xviii
IV. SECURITY CONSIDERATIONS .....	xix
V. SUBMITTERS .....	xix
VI. SOURCE OF THE CONTENT FOR THIS OGC DOCUMENT .....	xix
VII. VALIDITY OF CONTENT .....	xix
VIII. FUTURE WORK .....	xix
IX. CONTRIBUTORS .....	xx
1. SCOPE .....	2
2. CONFORMANCE .....	4
3. NORMATIVE REFERENCES .....	6
4. TERMS AND DEFINITIONS .....	8
5. CONVENTIONS .....	10
5.1. Identifiers .....	10
5.2. Other conventions .....	10
6. CORE .....	12
6.1. Coordinate Reference System Parameters .....	13
6.2. Coordinate Reference System Properties .....	14
6.3. Coordinate Reference System Types .....	18
7. COORDINATE OPERATION MODULE .....	27
7.1. Coordinate Operation Categories .....	27
7.2. Coordinate Operation Methods .....	30
7.3. Coordinate Operation Parameters .....	31
7.4. Coordinate Operation Properties .....	32

8. COORDINATE SYSTEM MODULE .....	36
8.1. 3D Coordinate Systems .....	36
8.2. Celestial Coordinate Systems .....	38
8.3. Coordinate System Components .....	40
8.4. Coordinate System Properties .....	40
8.5. Coordinate System Types .....	41
8.6. Temporal Coordinate Systems .....	46
9. DATUM MODULE .....	49
9.1. Datum Parameters .....	49
9.2. Datum Properties .....	50
9.3. Datum Types .....	51
9.4. Spheroid Properties .....	54
9.5. Spheroid Types .....	56
10. SRS APPLICATION MODULE .....	59
10.1. Map Types .....	59
10.2. SRS Application Types .....	61
11. PROJECTIONS MODULE .....	66
11.1. Azimuthal Projections .....	67
11.2. Compromise Projections .....	68
11.3. Conformal Projections .....	72
11.4. Conical Projections .....	74
11.5. Cylindrical Projections .....	77
11.6. Equal Area Projections .....	81
11.7. Equidistant Projections .....	83
11.8. Globular Projections .....	86
11.9. Lenticular Projections .....	87
11.10. Minimum Error Projections .....	91
11.11. Perspective Projections .....	91
11.12. Polyconic Projections .....	94
11.13. Polyhedral Projections .....	98
11.14. Pseudo Azimuthal Projections .....	102
11.15. Pseudo Conical Projections .....	104
11.16. Pseudo Cylindrical Projections .....	105
11.17. Stereographic Projections .....	120
12. PLANET MODULE .....	123
12.1. Interstellar Body .....	123
13. COMMON INSTANCES .....	127
13.1. Coordinate System Axis .....	127
13.2. SRS Literal Types .....	129
13.3. Spheroids .....	130

ANNEX A (INFORMATIVE) ALIGNMENTS .....	146
Overview .....	
A.1. IGN Ontology .....	146
A.2. ISO19111 Ontology .....	148
A.3. IFC Ontology .....	149
ANNEX B (INFORMATIVE) SHACL SHAPES .....	151
Overview .....	
ANNEX C (INFORMATIVE) REVISION HISTORY .....	153
BIBLIOGRAPHY .....	155

## LIST OF TABLES

---

Table 1 — geosrs:AreaOfUse .....	13
Table 2 — geosrs:Extent .....	13
Table 3 — geosrs:GeographicBoundingBox .....	13
Table 4 — geosrs:AxesList .....	14
Table 5 — geosrs:SingleCRSList .....	14
Table 6 — geosrs:baseCRS .....	14
Table 7 — geosrs:conversion .....	15
Table 8 — geosrs:coordinateSystem .....	15
Table 9 — geosrs:datum .....	16
Table 10 — geosrs:datumEnsemble .....	16
Table 11 — geosrs:domainOfValidity .....	16
Table 12 — geosrs:method .....	17
Table 13 — geocrs:asProj4 .....	17
Table 14 — geocrs:asProjJSON .....	17
Table 15 — geocrs:asWKT .....	18
Table 16 — geosrs:EPSGcode .....	18
Table 17 — geosrs:BoundCRS .....	19
Table 18 — geosrs:CompoundCRS .....	19
Table 19 — geosrs:CRS .....	19
Table 20 — geosrs:EngineeringCRS .....	20
Table 21 — geosrs:GeocentricCRS .....	20
Table 22 — geosrs:GeodeticCRS .....	21
Table 23 — geosrs:GeographicCRS .....	21
Table 24 — geosrs:ParametricCRS .....	21
Table 25 — geosrs:ProjectedCRS .....	22

Table 26 – geosrs:SelenographicCRS .....	22
Table 27 – geosrs:ReferenceSystem .....	22
Table 28 – geosrs:SingleCRS .....	22
Table 29 – geosrs:SpatialReferenceSystem .....	23
Table 30 – geosrs:SpatioParametricCompoundCRS .....	23
Table 31 – geosrs:SpatioParametricTemporalCompoundCRS .....	23
Table 32 – geosrs:SpatioTemporalCompoundCRS .....	24
Table 33 – geosrs:StaticCRS .....	24
Table 34 – geosrs:TemporalCRS .....	24
Table 35 – geosrs:VerticalCRS .....	25
Table 36 – geosrs:GeographicObject .....	27
Table 37 – geosrs:RegisterOperations .....	28
Table 38 – geosrs:ScaleOperation .....	28
Table 39 – geosrs:RotationOperation .....	28
Table 40 – geosrs:IdentityOperation .....	28
Table 41 – geosrs:ShearOperation .....	29
Table 42 – geosrs:TranslationOperation .....	29
Table 43 – geosrs:AffineTransformationOperation .....	29
Table 44 – geosrs:CoordinateTransformationOperation .....	30
Table 45 – geosrs:PassThroughOperation .....	30
Table 46 – geosrs:ConcatenatedOperation .....	30
Table 47 – geosrs:PointMotionOperation .....	31
Table 48 – geosrs:OperationParameterGroup .....	32
Table 49 – geosrs:ParameterValueGroup .....	32
Table 50 – geosrs:derivingConversion .....	33
Table 51 – geosrs:parameter .....	33
Table 52 – geosrs:sourceCRS .....	34
Table 53 – geosrs:targetCRS .....	34
Table 54 – geosrs:3DCoordinateSystem .....	37
Table 55 – geosrs:ConicalCoordinateSystem .....	37
Table 56 – geosrs:CylindricalCoordinateSystem .....	37
Table 57 – geosrs:CelestialCoordinateSystem .....	38
Table 58 – geosrs:EclipticCoordinateSystem .....	38
Table 59 – geosrs:EquatorialCoordinateSystem .....	39
Table 60 – geosrs:GalacticCoordinateSystem .....	39
Table 61 – geosrs:HorizontalCoordinateSystem .....	39
Table 62 – geosrs:PerifocalCoordinateSystem .....	40
Table 63 – geosrs:SuperGalacticCS .....	40
Table 64 – geosrs:axis .....	41
Table 65 – geosrs:axisDirection .....	41
Table 66 – geosrs:AffineCoordinateSystem .....	42

Table 67 – geosrs:BarycentricCoordinateSystem .....	42
Table 68 – geosrs:CurvilinearCoordinateSystem .....	43
Table 69 – geosrs:EngineeringCoordinateSystem .....	43
Table 70 – geosrs:GeodeticCoordinateSystem .....	43
Table 71 – geosrs:GeographicalCoordinateSystem .....	43
Table 72 – geosrs:GridCoordinateSystem .....	44
Table 73 – geosrs:HexagonalCoordinateSystem .....	44
Table 74 – geosrs:LocalCoordinateSystem .....	44
Table 75 – geosrs:ObliqueCoordinateSystem .....	45
Table 76 – geosrs:OrthogonalCoordinateSystem .....	45
Table 77 – geosrs:PlanarCoordinateSystem .....	45
Table 78 – geosrs:1DCoordinateSystem .....	46
Table 79 – geosrs:DateTimeTemporalCoordinateSystem .....	46
Table 80 – geosrs:TemporalCountCoordinateSystem .....	47
Table 81 – geosrs:TemporalCoordinateSystem .....	47
Table 82 – geosrs:TemporalMeasureCoordinateSystem .....	47
Table 83 – geosrs:DefiningParameter .....	49
Table 84 – geosrs:datumDefiningParameter .....	50
Table 85 – geosrs:ellipsoid .....	50
Table 86 – geosrs:primeMeridian .....	51
Table 87 – geosrs:DynamicGeodeticReferenceFrame .....	52
Table 88 – geosrs:DynamicVerticalDatum .....	52
Table 89 – geosrs:ParametricDatum .....	52
Table 90 – geosrs:EngineeringDatum .....	53
Table 91 – geosrs:TemporalDatum .....	53
Table 92 – geosrs:DatumEnsemble .....	53
Table 93 – geosrs:eccentricity .....	54
Table 94 – geosrs:inverseFlattening .....	54
Table 95 – geosrs:isSphere .....	55
Table 96 – geosrs:semiMajorAxis .....	55
Table 97 – geosrs:semiMinorAxis .....	56
Table 98 – geosrs:TriaxialEllipsoid .....	56
Table 99 – geosrs:CadastralMap .....	59
Table 100 – geosrs:NauticalChart .....	60
Table 101 – geosrs:ThematicMap .....	60
Table 102 – geosrs:TopographicMap .....	60
Table 103 – geosrs:WeatherMap .....	61
Table 104 – geosrs:SRSApplication .....	61
Table 105 – geosrs:SpatialReferencing .....	61
Table 106 – geosrs:EngineeringSurvey .....	62
Table 107 – geosrs:SatelliteSurvey .....	62



Table 108 – geosrs:SatelliteNavigation .....	62
Table 109 – geosrs:CoastalHydrography .....	62
Table 110 – geosrs:OffshoreEngineering .....	63
Table 111 – geosrs:Hydrography .....	63
Table 112 – geosrs:Drilling .....	63
Table 113 – geosrs:OilAndGasExploration .....	63
Table 114 – geosrs:BreusingGeometricProjection .....	67
Table 115 – geosrs:BreusingHarmonicProjection .....	67
Table 116 – geosrs:GinzburgIIProjection .....	67
Table 117 – geosrs:GinzburgIProjection .....	68
Table 118 – geosrs:GnomonicProjection .....	68
Table 119 – geosrs:JamesAzimuthalProjection .....	68
Table 120 – geosrs:ArmadilloProjection .....	69
Table 121 – geosrs:BakerDinomicProjection .....	69
Table 122 – geosrs:BertinProjection .....	69
Table 123 – geosrs:ChamberlinTrimetricProjection .....	69
Table 124 – geosrs:DenoyerSemiEllipticalProjection .....	70
Table 125 – geosrs:FairgrieveProjection .....	70
Table 126 – geosrs:LarriveeProjection .....	70
Table 127 – geosrs:PetermannStarProjection .....	70
Table 128 – geosrs:SpilhausOceanicProjection .....	71
Table 129 – geosrs:VanDerGrintenIIIProjection .....	71
Table 130 – geosrs:WinkelIIProjection .....	71
Table 131 – geosrs:WinkelIProjection .....	71
Table 132 – geosrs:WinkelSnyderProjection .....	71
Table 133 – geosrs:AdamsProjection .....	72
Table 134 – geosrs:AdamsWorldInASquareIIProjection .....	72
Table 135 – geosrs:AdamsWorldInASquareIProjection .....	73
Table 136 – geosrs:AugustEpicycloidalProjection .....	73
Table 137 – geosrs:CoxConformalProjection .....	73
Table 138 – geosrs:EisenlohrProjection .....	73
Table 139 – geosrs:GS50Projection .....	74
Table 140 – geosrs:PeirceQuincuncialProjection .....	74
Table 141 – geosrs:StereographicProjection .....	74
Table 142 – geosrs:BipolarObliqueConicConformalProjection .....	75
Table 143 – geosrs:CentralConicProjection .....	75
Table 144 – geosrs:HerschelConformalConicProjection .....	75
Table 145 – geosrs:Krovak .....	75
Table 146 – geosrs:LambertConformalConicProjection .....	76
Table 147 – geosrs:MurdochIIIProjection .....	76
Table 148 – geosrs:MurdochIIProjection .....	76



Table 149 – geosrs:MurdochIProjection .....	76
Table 150 – geosrs:SchjerningIProjection .....	77
Table 151 – geosrs:VitkovskyIProjection .....	77
Table 152 – geosrs:ArdenCloseProjection .....	77
Table 153 – geosrs:BraunPerspectiveProjection .....	78
Table 154 – geosrs:CompactMillerProjection .....	78
Table 155 – geosrs:CylindricalStereographicProjection .....	78
Table 156 – geosrs:KarchenkoShabanovaProjection .....	78
Table 157 – geosrs:LabordeProjection .....	79
Table 158 – geosrs:MercatorProjection .....	79
Table 159 – geosrs:MillerProjection .....	79
Table 160 – geosrs:PattersonCylindricalProjection .....	79
Table 161 – geosrs:PavlovProjection .....	80
Table 162 – geosrs:ToblerCylindricalIIProjection .....	80
Table 163 – geosrs:ToblerCylindricalIProjection .....	80
Table 164 – geosrs:UrmayevIIProjection .....	80
Table 165 – geosrs:WebMercatorProjection .....	80
Table 166 – geosrs:AlbersEqualAreaProjection .....	81
Table 167 – geosrs:AzimuthalEqualAreaProjection .....	81
Table 168 – geosrs:CylindricalEqualArea .....	82
Table 169 – geosrs:GallPetersProjection .....	82
Table 170 – geosrs:HoboDyerProjection .....	82
Table 171 – geosrs:LambertAzimuthalEqualArea .....	82
Table 172 – geosrs:TrystanEdwardsProjection .....	82
Table 173 – geosrs:WiechelProjection .....	83
Table 174 – geosrs:AzimuthalEquidistantProjection .....	83
Table 175 – geosrs:BerghausStarProjection .....	84
Table 176 – geosrs:CassiniProjection .....	84
Table 177 – geosrs:EquidistantConicProjection .....	84
Table 178 – geosrs:EquidistantCylindricalProjection .....	84
Table 179 – geosrs:EquirectangularProjection .....	85
Table 180 – geosrs:ObliquePlateCarreeProjection .....	85
Table 181 – geosrs:PlateCarreeProjection .....	85
Table 182 – geosrs:TwoPointEquidistantProjection .....	85
Table 183 – geosrs:ApianGlobularIProjection .....	86
Table 184 – geosrs:BaconGlobularProjection .....	86
Table 185 – geosrs:FournierGlobularIProjection .....	86
Table 186 – geosrs:A4Projection .....	87
Table 187 – geosrs:BriesemeisterProjection .....	87
Table 188 – geosrs:CiricIProjection .....	87
Table 189 – geosrs:CupolaProjection .....	88

Table 190 – geosrs:DedistortProjection .....	88
Table 191 – geosrs:DietrichKitadaProjection .....	88
Table 192 – geosrs:FranculaIIIProjection .....	88
Table 193 – geosrs:FranculaIVProjection .....	89
Table 194 – geosrs:FranculaXProjection .....	89
Table 195 – geosrs:FranculaVIIIProjection .....	89
Table 196 – geosrs:FranculaVProjection .....	89
Table 197 – geosrs:FranculaXIIIProjection .....	89
Table 198 – geosrs:FranculaXIIProjection .....	90
Table 199 – geosrs:FranculaXIVProjection .....	90
Table 200 – geosrs:HamusoidalProjection .....	90
Table 201 – geosrs:KissProjection .....	90
Table 202 – geosrs:AiryProjection .....	91
Table 203 – geosrs:CentralCylindricalProjection .....	92
Table 204 – geosrs:GeneralVerticalPerspectiveProjection .....	92
Table 205 – geosrs:GilbertTwoWorldPerspectiveProjection .....	92
Table 206 – geosrs:LaHireProjection .....	92
Table 207 – geosrs:LorgnaProjection .....	93
Table 208 – geosrs:LowryProjection .....	93
Table 209 – geosrs:OrthographicProjection .....	93
Table 210 – geosrs:PerspectiveConicProjection .....	93
Table 211 – geosrs:TiltedPerspectiveProjection .....	94
Table 212 – geosrs:VerticalPerspectiveProjection .....	94
Table 213 – geosrs:GinzburgIVProjection .....	94
Table 214 – geosrs:GinzburgIXProjection .....	95
Table 215 – geosrs:GinzburgVIProjection .....	95
Table 216 – geosrs:GinzburgVProjection .....	95
Table 217 – geosrs:GottWagnerProjection .....	95
Table 218 – geosrs:HillEucyclicProjection .....	96
Table 219 – geosrs:LagrangeProjection .....	96
Table 220 – geosrs:LaskowskiProjection .....	96
Table 221 – geosrs:RectangularPolyconicProjection .....	96
Table 222 – geosrs:StabiusWernerIIIProjection .....	96
Table 223 – geosrs:StabiusWernerIProjection .....	97
Table 224 – geosrs:VanDerGrintenIIProjection .....	97
Table 225 – geosrs:VanDerGrintenIProjection .....	97
Table 226 – geosrs:VanDerGrintenIVProjection .....	97
Table 227 – geosrs:WagnerIXProjection .....	98
Table 228 – geosrs:WagnerVIIIProjection .....	98
Table 229 – geosrs:WagnerVIIProjection .....	98
Table 230 – geosrs:AuthaGraphProjection .....	99

Table 231 – geosrs:CahillKeyesProjection .....	99
Table 232 – geosrs:CollignonButterflyProjection .....	99
Table 233 – geosrs:DodecahedralProjection .....	99
Table 234 – geosrs:DymaxionProjection .....	100
Table 235 – geosrs:GnomonicButterflyProjection .....	100
Table 236 – geosrs:GnomonicCubedSphereProjection .....	100
Table 237 – geosrs:GnomonicIcosahedronProjection .....	100
Table 238 – geosrs:GuyouProjection .....	100
Table 239 – geosrs:IcosahedralProjection .....	101
Table 240 – geosrs:LeeProjection .....	101
Table 241 – geosrs:MyrahedalProjection .....	101
Table 242 – geosrs:OctantProjection .....	101
Table 243 – geosrs:QuadrilateralizedSphericalCubeProjection .....	102
Table 244 – geosrs:WatermanButterflyProjection .....	102
Table 245 – geosrs:AitoffObliqueProjection .....	102
Table 246 – geosrs:AitoffProjection .....	103
Table 247 – geosrs:HammerProjection .....	103
Table 248 – geosrs:Strebe1995Projection .....	103
Table 249 – geosrs:WinkelTripelProjection .....	103
Table 250 – geosrs:AmericanPolyconicProjection .....	104
Table 251 – geosrs:BonneProjection .....	104
Table 252 – geosrs:BottomleyProjection .....	104
Table 253 – geosrs:NicolosiGlobularProjection .....	105
Table 254 – geosrs:PtolemyIIProjection .....	105
Table 255 – geosrs:WernerProjection .....	105
Table 256 – geosrs:ApianIIProjection .....	106
Table 257 – geosrs:AtlantisProjection .....	106
Table 258 – geosrs:BaranyiIIIProjection .....	106
Table 259 – geosrs:BaranyiIIProjection .....	107
Table 260 – geosrs:BaranyiIProjection .....	107
Table 261 – geosrs:BaranyiIVProjection .....	107
Table 262 – geosrs:BoggsEumorphicProjection .....	107
Table 263 – geosrs:BromleyProjection .....	108
Table 264 – geosrs:CabotProjection .....	108
Table 265 – geosrs:CollignonProjection .....	108
Table 266 – geosrs:CrasterParabolicProjection .....	108
Table 267 – geosrs:DeakinMinimumErrorProjection .....	109
Table 268 – geosrs:Eckert1Projection .....	109
Table 269 – geosrs:Eckert2Projection .....	109
Table 270 – geosrs:Eckert3Projection .....	109
Table 271 – geosrs:Eckert4Projection .....	110

Table 272 – geosrs:Eckert5Projection .....	110
Table 273 – geosrs:Eckert6Projection .....	110
Table 274 – geosrs:EqualEarthProjection .....	110
Table 275 – geosrs:FaheyProjection .....	110
Table 276 – geosrs:FoucautProjection .....	111
Table 277 – geosrs:FoucautSinusoidalProjection .....	111
Table 278 – geosrs:FournierIIProjection .....	111
Table 279 – geosrs:GinzburgVIIIProjection .....	111
Table 280 – geosrs:GoodeHomolosineProjection .....	112
Table 281 – geosrs:HEALPixProjection .....	112
Table 282 – geosrs:HufnagelProjection .....	112
Table 283 – geosrs:Kavrayskiy7Projection .....	112
Table 284 – geosrs:LoximuthalProjection .....	113
Table 285 – geosrs:MayrProjection .....	113
Table 286 – geosrs:McBrydeThomasFlatPolarParabolicProjection .....	113
Table 287 – geosrs:McBrydeThomasFlatPolarQuarticProjection .....	113
Table 288 – geosrs:McBrydeThomasFlatPolarSinusoidalProjection .....	113
Table 289 – geosrs:McBrydeThomasIIProjection .....	114
Table 290 – geosrs:McBrydeThomasIProjection .....	114
Table 291 – geosrs:NaturalEarth2Projection .....	114
Table 292 – geosrs:NaturalEarthProjection .....	114
Table 293 – geosrs:NellHammerProjection .....	115
Table 294 – geosrs:NellProjection .....	115
Table 295 – geosrs:OrteliusOvalProjection .....	115
Table 296 – geosrs:PutninsP1Projection .....	115
Table 297 – geosrs:PutninsP2Projection .....	116
Table 298 – geosrs:PutninsP3Projection .....	116
Table 299 – geosrs:PutninsP5Projection .....	116
Table 300 – geosrs:PutninsP6Projection .....	116
Table 301 – geosrs:QuarticAuthalicProjection .....	116
Table 302 – geosrs:RobinsonProjection .....	117
Table 303 – geosrs:SinusoidalProjection .....	117
Table 304 – geosrs:TheTimesProjection .....	117
Table 305 – geosrs:ToblerG1Projection .....	117
Table 306 – geosrs:ToblerHyperellipticalProjection .....	118
Table 307 – geosrs:WagnerIIIProjection .....	118
Table 308 – geosrs:WagnerIIProjection .....	118
Table 309 – geosrs:WagnerIProjection .....	118
Table 310 – geosrs:WagnerIVProjection .....	118
Table 311 – geosrs:WagnerVIProjection .....	119
Table 312 – geosrs:WagnerVProjection .....	119

Table 313 – geosrs:WerenskioldIProjection .....	119
Table 314 – geosrs:PutninsP3'Projection .....	119
Table 315 – geosrs:PutninsP4'Projection .....	120
Table 316 – geosrs:PutninsP5'Projection .....	120
Table 317 – geosrs:PutninsP6'Projection .....	120
Table 318 – geosrs:MillerOblatedStereographicProjection .....	121
Table 319 – geosrs:RoussilheProjection .....	121
Table 320 – geosrs:ArtificialSatellite .....	123
Table 321 – geosrs:Asteroid .....	123
Table 322 – geosrs:Comet .....	124
Table 323 – geosrs:DwarfPlanet .....	124
Table 324 – geosrs:InterstellarBody .....	124
Table 325 – geosrs:Moon .....	124
Table 326 – geosrs:NaturalSatellite .....	124
Table 327 – geosrs:Planet .....	125
Table 328 – geosrs:PlanetStatus .....	125
Table 329 – geosrs:Plutoid .....	125
Table 330 – geosrs:Star .....	125
Table 331 – geosrs:down .....	127
Table 332 – geosrs:east .....	128
Table 333 – geosrs:north .....	128
Table 334 – geosrs:south .....	128
Table 335 – geosrs:up .....	128
Table 336 – geosrs:west .....	129
Table 337 – geosrs:proj4Literal .....	129
Table 338 – geosrs:projJSONLiteral .....	130
Table 339 – geosrs:wktLiteral .....	130
Table 340 – geosrs:GRS1980 .....	131
Table 341 – geosrs:GRS67 .....	131
Table 342 – geosrs:PZ90 .....	131
Table 343 – geosrs:Airy1830 .....	132
Table 344 – geosrs:AiryModified1849 .....	132
Table 345 – geosrs:International1924 .....	132
Table 346 – geosrs:AustralianNationalSpheroid .....	133
Table 347 – geosrs:Everest1930 .....	133
Table 348 – geosrs:Clarke1866 .....	133
Table 349 – geosrs:Plessis1817 .....	134
Table 350 – geosrs:Danish1876 .....	134
Table 351 – geosrs:Struve1860 .....	134
Table 352 – geosrs:IAG1975 .....	134
Table 353 – geosrs:Clarke1858 .....	135

Table 354 – geosrs:Clarke1880 .....	135
Table 355 – geosrs:Helmert1906 .....	135
Table 356 – geosrs:CGCS2000 .....	136
Table 357 – geosrs:GSK-2011 .....	136
Table 358 – geosrs:Zach1812 .....	136
Table 359 – geosrs:Clarke1880ARC .....	137
Table 360 – geosrs:Clarke1880IGN .....	137
Table 361 – geosrs:WGS66 .....	137
Table 362 – geosrs:WGS72 .....	138
Table 363 – geosrs:WGS84 .....	138
Table 364 – geosrs:Krassowsky1940 .....	138
Table A.1 – Alignment: Namespaces .....	146
Table A.2 – Alignment: IGN Ontology .....	147
Table A.3 – Alignment: ISO19111 Ontology .....	148
Table A.4 – Alignment: IFC Ontology .....	149

## LIST OF FIGURES

---

Figure 1 .....	12
----------------	----

## LIST OF NORMATIVE STATEMENTS

---

REQUIREMENTS CLASS 1: 06-CORE.ADOC EXTENSION .....	12
REQUIREMENTS CLASS 2: 07-CO_MODULE.ADOC EXTENSION .....	27
REQUIREMENTS CLASS 3: 08-CS_MODULE.ADOC EXTENSION .....	36
REQUIREMENTS CLASS 4: 09-DATUM_MODULE.ADOC EXTENSION .....	49
REQUIREMENTS CLASS 5: 10-SRSAPPLICATION_MODULE.ADOC EXTENSION .....	59
REQUIREMENTS CLASS 6: 11-PROJECTIONS_MODULE.ADOC EXTENSION .....	66
REQUIREMENTS CLASS 7: 12-PLANET_MODULE.ADOC EXTENSION .....	123
REQUIREMENTS CLASS 8: 13-INSTANCES.ADOC EXTENSION .....	127
REQUIREMENT 1: COORDINATE REFERENCE SYSTEM PARAMETERS .....	13
REQUIREMENT 2: COORDINATE REFERENCE SYSTEM PROPERTIES .....	14
REQUIREMENT 3: COORDINATE REFERENCE SYSTEM TYPES .....	19
REQUIREMENT 4: COORDINATE OPERATION CATEGORIES .....	27

REQUIREMENT 5: COORDINATE OPERATION METHODS .....	30
REQUIREMENT 6: COORDINATE OPERATION PARAMETERS .....	32
REQUIREMENT 7: COORDINATE OPERATION PROPERTIES .....	33
REQUIREMENT 8: 3D COORDINATE SYSTEMS .....	36
REQUIREMENT 9: CELESTIAL COORDINATE SYSTEMS .....	38
REQUIREMENT 10: COORDINATE SYSTEM COMPONENTS .....	40
REQUIREMENT 11: COORDINATE SYSTEM PROPERTIES .....	40
REQUIREMENT 12: COORDINATE SYSTEM TYPES .....	42
REQUIREMENT 13: TEMPORAL COORDINATE SYSTEMS .....	46
REQUIREMENT 14: DATUM PARAMETERS .....	49
REQUIREMENT 15: DATUM PROPERTIES .....	50
REQUIREMENT 16: DATUM TYPES .....	51
REQUIREMENT 17: SPHEROID PROPERTIES .....	54
REQUIREMENT 18: SPHEROID TYPES .....	56
REQUIREMENT 19: MAP TYPES .....	59
REQUIREMENT 20: SRS APPLICATION TYPES .....	61
REQUIREMENT 21: AZIMUTHAL PROJECTIONS .....	67
REQUIREMENT 22: COMPROMISE PROJECTIONS .....	68
REQUIREMENT 23: CONFORMAL PROJECTIONS .....	72
REQUIREMENT 24: CONICAL PROJECTIONS .....	74
REQUIREMENT 25: CYLINDRICAL PROJECTIONS .....	77
REQUIREMENT 26: EQUAL AREA PROJECTIONS .....	81
REQUIREMENT 27: EQUIDISTANT PROJECTIONS .....	83
REQUIREMENT 28: GLOBULAR PROJECTIONS .....	86
REQUIREMENT 29: LENTICULAR PROJECTIONS .....	87
REQUIREMENT 30: MINIMUM ERROR PROJECTIONS .....	91
REQUIREMENT 31: PERSPECTIVE PROJECTIONS .....	91
REQUIREMENT 32: POLYCONIC PROJECTIONS .....	94
REQUIREMENT 33: POLYHEDRAL PROJECTIONS .....	98
REQUIREMENT 34: PSEUDO AZIMUTHAL PROJECTIONS .....	102
REQUIREMENT 35: PSEUDO CONICAL PROJECTIONS .....	104
REQUIREMENT 36: PSEUDO CYLINDRICAL PROJECTIONS .....	105
REQUIREMENT 37: STEREOGRAPHIC PROJECTIONS .....	120



REQUIREMENT 38: INTERSTELLAR BODY .....	123
REQUIREMENT 39: COORDINATE SYSTEM AXIS .....	127
REQUIREMENT 40: SRS LITERAL TYPES .....	129
REQUIREMENT 41: SPHEROIDS .....	130



## ABSTRACT

---

<Insert Abstract Text here>



## KEYWORDS

---

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

---

No security considerations have been made for this Standard.

## V

## SUBMITTERS

---

All questions regarding this submission should be directed to the editor or the submitters:

NAME	AFFILIATION	OGC MEMBER
Luís Moreira de Sousa	Instituto Superior Técnico: Lisbon, PT	Yes
Timo Homburg	Mainz University Of Applied Sciences	No
Nathalie Abadie	IGN France	Yes
Ghislain Atemezang	European Union Agency for Railways (ERA)	Yes

## VI

## SOURCE OF THE CONTENT FOR THIS OGC DOCUMENT

---

## VII

## VALIDITY OF CONTENT

---

## 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

---

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.

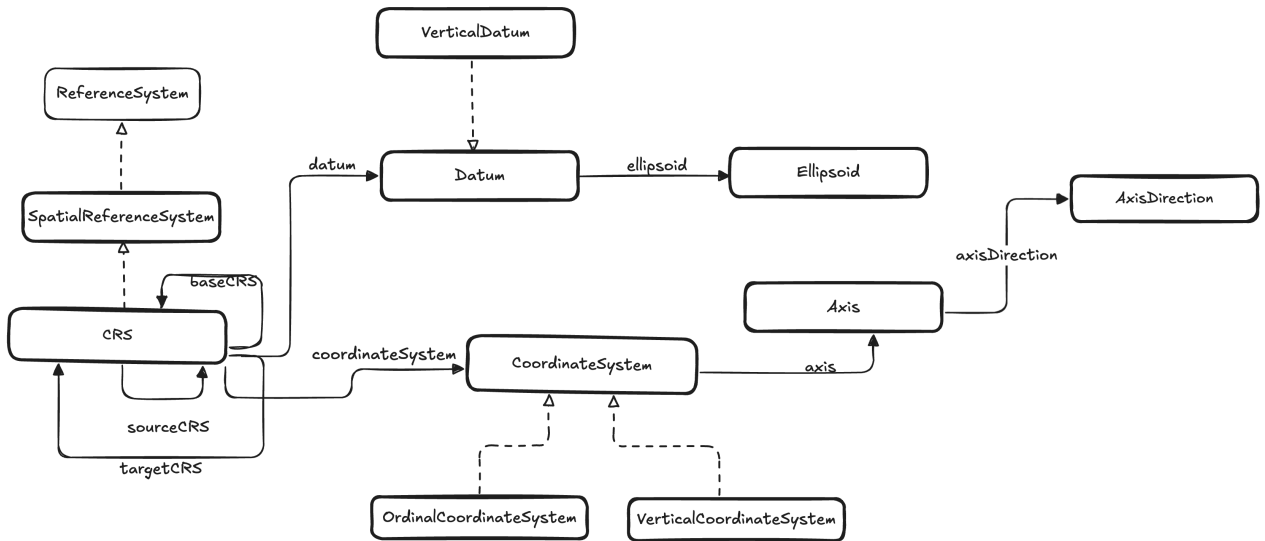


Figure 1

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>
---------------	--

### 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>
-----	---

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="#">geosrs:CoordinateOperation</a> , <a href="#">geosrs:PassThroughOperation</a> , <a href="#">geosrs:ConcatenatedOperation</a> , <a href="#">geosrs:SingleOperation</a> , <a href="#">geosrs:Transformation</a> , <a href="#">geosrs:Conversion</a> , <a href="#">geosrs:PointMotionOperation</a> , <a href="#">geosrs:OperationMethod</a> to be used in SPARQL graph patterns.

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

**Table 45** — [geosrs: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: [geosrs:ConcatenatedOperation](#)

**Table 46** — [geosrs: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

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.

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	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.
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 <code>geosrs:derivingConversion</code> , <code>geosrs:parameter</code> , <code>geosrs:sourceCRS</code> , <code>geosrs:targetCRS</code> 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

---

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

The class geosrs:3DCoordinateSystem describes a coordinate system in three dimesions. These coordinate systems are common for 3D representations or 2D representations with a time aspect.

**Table 54** — geosrs:3DCoordinateSystem

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

**Table 55** — geosrs:ConicalCoordinateSystem

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

**Table 56** — geosrs:CylindricalCoordinateSystem

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

## 8.2. Celestial Coordinate Systems

### REQUIREMENT 9: CELESTIAL COORDINATE SYSTEMS

**IDENTIFIER**      `/req/Celestial_Coordinate_Systems`

**STATEMENT**

Implementations shall allow the RDFS classes `geosrs:CelestialCoordinateSystem`, `geosrs:EclipticCoordinateSystem`, `geosrs:EquatorialCoordinateSystem`, `geosrs:GalacticCoordinateSystem`, `geosrs:HorizontalCoordinateSystem`, `geosrs:PerifocalCoordinateSystem`, `geosrs:SuperGalacticCS` to be used in SPARQL graph patterns.

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

**Table 57** — `geosrs:CelestialCoordinateSystem`

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`

**Table 58** — `geosrs:EclipticCoordinateSystem`

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`

**Table 59** — geosrs:EquatorialCoordinateSystem

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

**Table 60** — geosrs:GalacticCoordinateSystem

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

**Table 61** — geosrs:HorizontalCoordinateSystem

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

**Table 62** — geosrs:PerifocalCoordinateSystem

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

**Table 63** — geosrs:SuperGalacticCS

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 geosrs:CoordinateSystemAxis to be used in SPARQL graph patterns.

## 8.4. Coordinate System Properties

### REQUIREMENT 11: COORDINATE SYSTEM PROPERTIES

IDENTIFIER	/req/Coordinate_System_Properties
------------	-----------------------------------



## REQUIREMENT 11: COORDINATE SYSTEM PROPERTIES

### STATEMENT

Implementations shall allow the RDFS properties `geosrs:axis`, `geosrs:axisDirection` 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>

### 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`

**Table 66** — `geosrs:AffineCoordinateSystem`

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="#"><code>CoordinateSystem</code></a>

### 8.5.2. Class: `geosrs:BarycentricCoordinateSystem`

**Table 67** — `geosrs:BarycentricCoordinateSystem`

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="#"><code>CoordinateSystem</code></a>

### 8.5.3. Class: `geosrs:CurvilinearCoordinateSystem`

**Table 68** — geosrs:CurvilinearCoordinateSystem

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

**Table 69** — geosrs:EngineeringCoordinateSystem

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

**Table 70** — geosrs:GeodeticCoordinateSystem

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

**Table 71** — geosrs:GeographicalCoordinateSystem

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

**Table 72** — geosrs:GridCoordinateSystem

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

**Table 73** — geosrs:HexagonalCoordinateSystem

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

**Table 74** — geosrs:LocalCoordinateSystem

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

**Table 75** — geosrs:ObliqueCoordinateSystem

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

**Table 76** — geosrs:OrthogonalCoordinateSystem

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

**Table 77** — geosrs:PlanarCoordinateSystem

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

The class geosrs:1DCoordinateSystem describes a coordinate system with only one dimension. Often, these definitions include temporal coordinate systems which only represent time using one coordinate system axis.

Table 78 — geosrs:1DCoordinateSystem

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="#">CoordinateSystem</a>

## 8.6.2. Class: geosrs:DateTimeTemporalCoordinateSystem

Table 79 — geosrs:DateTimeTemporalCoordinateSystem

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

### 8.6.3. Class: geosrs:TemporalCountCoordinateSystem

**Table 80** — geosrs:TemporalCountCoordinateSystem

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

### 8.6.4. Class: geosrs:TemporalCoordinateSystem

**Table 81** — geosrs:TemporalCoordinateSystem

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

### 8.6.5. Class: geosrs:TemporalMeasureCoordinateSystem

**Table 82** — geosrs:TemporalMeasureCoordinateSystem

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

9

# DATUM MODULE

---



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="#">xsd:double</a>
Domain	<a href="#">Ellipsoid</a>
Example	<a href="#">geosrs:inverseFlattening</a>

### 9.4.3. Property: geosrs:isSphere

**Table 95** — geosrs:isSphere

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

### 9.4.4. Property: geosrs:semiMajorAxis

**Table 96** — geosrs:semiMajorAxis

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

Domain	<a href="#">Ellipsoid</a>
Example	<a href="#">geosrs:semiMajorAxis</a>

### 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

---

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="#">SRSApplication</a>
Example	<a href="#">geosrs:CadastreMap</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>
Example	<a href="#">geosrs:TopographicMap</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>
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:Coastal Hydrography, geosrs:OffshoreEngineering, geosrs:Hydrography, geosrs:Drilling, geosrs:OilAndGas Exploration 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>
Example	<a href="#">geosrs:EngineeringSurvey</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>
Example	<a href="#">geosrs:CoastalHydrography</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>
Example	<code>geosrs:OffshoreEngineering</code>

### 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>
Example	<code>geosrs:Hydrography</code>

### 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>
Example	<code>geosrs:Drilling</code>

### 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>
-----	---







11

# PROJECTIONS MODULE

---

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

# 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>
-----	---

## 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>

### 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:SchjernerIProjection

**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:VitkovskylProjection

**Table 151** — geosrs:VitkovskylProjection

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

### 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>
-----	---



## 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

[EqualAreaProjection](#)

### 11.6.8. Class: geosrs:WiechelProjection

Table 173 — geosrs:WiechelProjection

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

### 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>
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>
Example	<a href="#">geosrs:AiryProjection</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>
Example	<a href="#">geosrs:CentralCylindricalProjection</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>
Super-classes	<a href="#">PerspectiveProjection</a>

### 11.11.6. Class: geosrs:LowryProjection

Table 208 — geosrs:LowryProjection

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

### 11.11.7. Class: geosrs:OrthographicProjection

Table 209 — geosrs:OrthographicProjection

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

### 11.11.8. Class: geosrs:PerspectiveConicProjection

Table 210 — geosrs:PerspectiveConicProjection

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

### 11.11.9. Class: geosrs:TiltedPerspectiveProjection

**Table 211** — geosrs:TiltedPerspectiveProjection

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

### 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>
Super-classes	<a href="#">PolyconicProjection</a>

**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:CahillKeyes Projection, geosrs:CollignonButterflyProjection, geosrs:DodecahedralProjection, geosrs:Dymaxion Projection, geosrs:GnomonicButterflyProjection, geosrs:GnomonicCubedSphereProjection, geosrs:GnomonicIcosahedronProjection, geosrs:GuyouProjection, geosrs:IcosahedralProjection, geosrs:Lee Projection, geosrs:MyrahedalProjection, geosrs:OctantProjection, geosrs:QuadrilateralizedSpherical CubeProjection, 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>
Super-classes	<a href="#">PolyhedralProjection</a>

### 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:MyrahedalProjection

**Table 241** — geosrs:MyrahedalProjection

URI	<a href="https://w3id.org/geosrs/projection/MyrahedalProjection">https://w3id.org/geosrs/projection/MyrahedalProjection</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

Requirement 35: Pseudo Conical Projections	
IDENTIFIER	/req/Pseudo_Conical_Projections
STATEMENT	Implementations shall allow the RDFS classes geosrs:AmericanPolyconicProjection, geosrs:BonneProjection, geosrs:BottomleyProjection, geosrs:NicolosiGlobularProjection, geosrs:PtolemyIIProjection, geosrs:WernerProjection 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:

## REQUIREMENT 36: PSEUDO CYLINDRICAL PROJECTIONS

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, 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

[PseudoCylindricalProjection](#)

#### 11.16.4. Class: geosrs:BaranyillProjection

**Table 259** — geosrs:BaranyillProjection

URI

<https://w3id.org/geosrs/projection/BaranyillProjection>

Super-classes

[PseudoCylindricalProjection](#)

#### 11.16.5. Class: geosrs:BaranyilProjection

**Table 260** — geosrs:BaranyilProjection

URI

<https://w3id.org/geosrs/projection/BaranyilProjection>

Super-classes

[PseudoCylindricalProjection](#)

#### 11.16.6. Class: geosrs:BaranyilVProjection

**Table 261** — geosrs:BaranyilVProjection

URI

<https://w3id.org/geosrs/projection/BaranyilVProjection>

Super-classes

[PseudoCylindricalProjection](#)

#### 11.16.7. Class: geosrs:BoggsEumorphicProjection

**Table 262** — geosrs:BoggsEumorphicProjection

URI

[https://w3id.org/geosrs/projection/  
BoggsEumorphicProjection](https://w3id.org/geosrs/projection/BoggsEumorphicProjection)

Super-classes

[PseudoCylindricalProjection](#)

### 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:WagnerVIProjection

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>
-----	---

### 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>
-----	---

### 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>
-----	---

### 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>
-----	---

### 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>
-----	---

### 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>
-----	---

### 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>
-----	---

### 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
	<code>/req/SRS_Literal_Types</code>
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	<code>geosrs:AxisDirection</code>
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. SRS Literal Types

### REQUIREMENT 40: SRS LITERAL TYPES

**IDENTIFIER**      /req/SRS\_Literal\_Types

**STATEMENT**      Implementations shall allow the RDFS instances [geosrs:proj4Literal](#), [geosrs:projJSONLiteral](#), [geosrs:wktLiteral](#) to be used in SPARQL graph patterns.

### 13.2.1. Instance: geosrs:proj4Literal

**Table 337** — geosrs:proj4Literal

URI	<a href="https://w3id.org/geosrs/proj4Literal">https://w3id.org/geosrs/proj4Literal</a>
Type	<a href="#">rdf:Datatype[rdf:Datatype]</a>
Definition	A literal which stores a proj4 String
Example	<a href="#">geosrs:proj4Literal</a>

### 13.2.2. Instance: geosrs:projJSONLiteral

Table 338 — geosrs:projJSONLiteral

URI	<a href="https://w3id.org/geosrs/projJSONLiteral">https://w3id.org/geosrs/projJSONLiteral</a>
Type	rdf:Datatype[rdf:Datatype]
Definition	A literal which stores a projection JSON (ProjJSON) String
Example	<a href="#">geosrs:projJSONLiteral</a>

### 13.2.3. Instance: geosrs:wktLiteral

Table 339 — geosrs:wktLiteral

URI	<a href="https://w3id.org/geosrs/wktLiteral">https://w3id.org/geosrs/wktLiteral</a>
Type	rdf:Datatype[rdf:Datatype]
Definition	A literal which stores a WKT for CRS String
Example	<a href="#">geosrs:wktLiteral</a>

## 13.3. Spheroids

### REQUIREMENT 41: SPHEROIDS

IDENTIFIER /req/Spheroids

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.

### 13.3.1. Instance: geosrs:GRS1980

**Table 340** — 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="#">geosrs:GRS1980</a>

### 13.3.2. Instance: geosrs:GRS67

**Table 341** — geosrs:GRS67

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

### 13.3.3. Instance: geosrs:PZ90

**Table 342** — geosrs:PZ90

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

### 13.3.4. Instance: geosrs:Airy1830

**Table 343** — geosrs:Airy1830

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

### 13.3.5. Instance: geosrs:AiryModified1849

**Table 344** — 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>

### 13.3.6. Instance: geosrs:International1924

**Table 345** — 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>

### 13.3.7. Instance: geosrs:AustralianNationalSpheroid

**Table 346** — 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>

### 13.3.8. Instance: geosrs:Everest1930

**Table 347** — 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

### 13.3.9. Instance: geosrs:Clarke1866

**Table 348** — 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>

### 13.3.10. Instance: geosrs:Plessis1817

**Table 349** — 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>

### 13.3.11. Instance: geosrs:Danish1876

**Table 350** — 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>

### 13.3.12. Instance: geosrs:Struve1860

**Table 351** — 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>

### 13.3.13. Instance: geosrs:IAG1975

**Table 352** — 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>

### 13.3.14. Instance: geosrs:Clarke1858

**Table 353** — geosrs:Clarke1858

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

### 13.3.15. Instance: geosrs:Clarke1880

**Table 354** — 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>

### 13.3.16. Instance: geosrs:Helmert1906

**Table 355** — 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>

### 13.3.17. Instance: geosrs:CGCS2000

**Table 356** — 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>

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

**Table 357** — 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

### 13.3.19. Instance: geosrs:Zach1812

**Table 358** — 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>



### 13.3.20. Instance: geosrs:Clarke1880ARC

**Table 359** — 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>

### 13.3.21. Instance: geosrs:Clarke1880IGN

**Table 360** — 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>

### 13.3.22. Instance: geosrs:WGS66

**Table 361** — 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

### 13.3.23. Instance: geosrs:WGS72

**Table 362 — 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>

### 13.3.24. Instance: geosrs:WGS84

**Table 363 — 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>

### 13.3.25. Instance: geosrs:Krassowsky1940

**Table 364 — 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

---



# 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

---



## ANNEX B (INFORMATIVE) SHACL SHAPES

---

Overview

### Overview

---



# ANNEX C (INFORMATIVE) REVISION HISTORY

---





## ANNEX C (INFORMATIVE) REVISION HISTORY

---

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



# BIBLIOGRAPHY





## BIBLIOGRAPHY

---

**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>