ISO 19136:2007-09 (E)

Geographic information - Geography Markup Language (GML)

Contents

Page

Foreword vi

Introduction vii

1 Scope 1

2 Conformance 1
2.1 Conformance requirements 1
2.2 Conformance classes related to GML application schemas 2
2.3 Conformance classes related to GML profiles 2
2.4 Conformance classes related to GML documents 4
2.5 Conformance classes related to software implementations 4

3 Normative references 4

4 Terms and symbols 5
4.1 Terms and definitions 5
4.2 Symbols and abbreviated terms 12

5 Conventions 13
5.1 XML namespaces 13
5.2 Versioning 14
5.3 Deprecated parts of previous versions of GML 14
5.4 UML notation 14
5.5 XML Schema 16

6 Overview of the GML schema 16
6.1 GML schema 16
6.2 GML application schemas 16

and GML application schemas 17
6.4 Organization of this International Standard 18
6.5 Deprecated and experimental schema components 19

7 GML schema -- General rules and base schema components 20
7.1 GML model and syntax 20
7.2 gmlBase schema components 22

8 GML schema -- Xlinks and basic types 33
8.1 Xlinks -- Object associations and remote properties 33
8.2 Basic types 34

9 GML schema -- Features 43
9.1 General concepts 43
9.3 Features 43
9.4 Standard feature properties 44
9.5 Geometry properties 46
9.6 Topology properties 48
9.7 Temporal properties 48
9.8 Defining application-specific feature types 49
9.9 Feature collections 50
9.10 Spatial reference system used in a feature or feature collection 52

10 GML schema -- Geometric primitives 52
10.1 General concepts 52
10.2 Abstract geometric primitives 58
10.3 Geometric primitives (0-dimensional) 59
10.4 Geometric primitives (1-dimensional) 60
10.5 Geometric primitives (2-dimensional) 72
10.6 Geometric primitives (3-dimensional) 81

11 GML schema -- Geometric complex, geometric composites and geometric aggregates 83
11.1 Overview 83
11.2 Geometric complex and geometric composites 84
11.3 Geometric aggregates 86

12 GML schema -- Coordinate reference systems schemas 91
12.1 Overview 91
12.2 Reference systems 93
12.3 Coordinate reference systems 95
12.4 Coordinate systems 103
12.5 Datums 110
12.6 Coordinate operations 117

13 GML schema -- Topology 129
13.1 General concepts 129
13.2 Abstract topology 130
13.3 Topological primitives 130
13.4 Topological collections 135
13.5 Topology complex 137

14 GML schema -- Temporal information and dynamic features 139
14.1 General concepts 139
14.2 Temporal schema 140
14.3 Temporal topology schema 148
14.4 Temporal reference systems 151
14.5 Representing dynamic features 158

15 GML schema -- Definitions and dictionaries 162
15.1 Overview 162
15.2 Dictionary schema 162

16 GML schema -- Units, measures and values 165
16.1 Introduction 165
16.2 Units schema 165
16.3 Measures schema 171
16.4 Value objects schema 172

17 GML schema -- Directions 179
17.1 Direction schema 179
17.2 direction, DirectionPropertyType 179
17.3 DirectionVectorType 180
17.4 DirectionDescriptionType 180

18 GML schema -- Observations 181
18.1 Observations 181
18.2 Observation schema 182

19 GML schema -- Coverages 185
19.1 The coverage model and representations 185
19.2 Grids schema 188
19.3 Coverage schema 191

20 Profiles 205

20.1 Profiles of GML and application schemas 205
20.2 Definition of profile 205
20.3 Relation to application schema 205
20.4 Rules for elements and types in a profile 206
20.5 Rules for referencing GML profiles from application schemas 207
20.6 Recommendations for application schemas using GML profiles 207
20.7 Summary of rules for GML profiles 208

21 Rules for GML application schemas 208
21.1 Instances of GML objects 208
21.2 GML application schemas 209
21.3 Schemas defining Features and Feature Collections 212
21.4 Schemas defining spatial geometries 213
21.5 Schemas defining spatial topologies 214
21.6 Schemas defining time 215
21.7 Schemas defining coordinate reference systems 215
21.8 Schemas defining coverages 216
21.9 Schemas defining observations 218
21.10 Schemas defining dictionaries and definitions 219
21.11 Schemas defining values 220
21.12 GML profiles of the GML schema 220

Annex A (normative) Abstract test suites for GML application schemas, GML profiles and GML documents 223

Annex B (normative) Abstract test suite for software implementations 238

Annex C (informative) GML schema 242

Extensions 244

Annex E (normative) UML-to-GML application schema encoding rules 309

Annex F (normative) GML-to-UML application schema encoding rules 329

Annex G (informative) Guidelines for subsetting the GML schema 339

Annex H (informative) Default styling 352

Annex I (informative) Backwards compatibility with earlier versions of GML 363

Annex J (informative) Modularization and dependencies 380

Bibliography 382

Index 384