ISO 19170-1:2021-05 (E)

Geographic information - Discrete Global Grid Systems Specifications - Part 1: Core Reference System and Operations, and Equal Area Earth Reference System

Contents

Page

Foreword iv

Introduction v

1 Scope 1

2 Normative references 1

3 Terms and definitions 1

4 Conventions 10
4.1 Abbreviated terms 10
4.2 Uniform Resource Identifiers 10
4.3 Unified Modelling Language notation 11
4.4 Naming conventions 11
4.5 Attribute and association role status 11

5 DGGS specification overview 12
5.1 Package overview 12

6 Common Spatio-temporal Classes package 14
6.1 Common Spatio-temporal Classes overview 14
6.2 Temporal and Zonal Geometry package 15
6.2.1 Temporal Geometry and Topology module 15
6.2.2 Zonal Geometry and Topology module 21
6.3 Temporal and Zonal RS using Identifiers package 25
6.3.1 Spatial Location module 25
6.3.2 Temporal RS using Identifiers module 26
6.3.3 Zonal RS using Identifiers module 29

7 DGGS Core package 36
7.1 DGGS Core package conformance classes 36
7.2 Core RS using Zonal Identifiers with Structured Geometry module 37
7.2.1 Core RS data model and base CRS 37
7.2.2 Defining tables 39
7.2.3 Global domain 44
7.2.4 Cells and zones 44
7.2.5 Discrete global grid and its sequence 45
7.3 DGGS Core functions 45
7.3.1 Core Quantization Functions module 45
7.3.2 Defining tables 47
7.3.3 Core Topological Query Functions module 50
7.3.4 Defining tables 55
7.3.5 Core Interoperation Functions module 57

8 Equal-Area Earth DGGS 64
8.1 Equal-Area Earth DGGS package 64
8.1.1 Equal-Area Earth RS module 64
8.1.2 Defining tables 67
8.1.3 Global domain 70
8.1.4 Equal-Area Tessellation module 70

8.1.5 Equal-Area Cell module 74

Annex A (normative) Abstract test suite 80

Annex B (informative) Equal area DGGS theory 91

Annex C (informative) Background to DGGSs 96

Annex D (informative) Temporal geometry, topology, and temporal referencing by named periods: context for modelling 101

Bibliography 103