

DIN EN ISO 19156:2024-08 (E)

Geographic information - Observations, measurements and samples (ISO 19156:2023); English version EN ISO 19156:2023

Contents		Page
Foreword.....		ix
Introduction.....		x
1	Scope.....	1
2	Normative references.....	1
3	Terms and definitions.....	1
4	Document conventions.....	5
4.1	Abbreviated terms and acronyms.....	5
4.2	Schema language.....	5
4.3	Model element names.....	6
4.4	Requirements and recommendations.....	6
4.5	Requirements classes.....	7
4.6	Conformance classes.....	7
4.7	Identifiers.....	8
4.8	Associations in UML context diagrams.....	8
5	Conformance.....	8
5.1	Overview.....	8
5.2	Conformance classes.....	9
6	Packaging, requirements and dependencies.....	11
6.1	Requirements.....	11
6.2	UML.....	12
6.2.1	UML package structure.....	12
6.2.2	UML package dependencies.....	12
6.3	Note on the use of "Any".....	14
7	Fundamental characteristics of observations and samples (informative).....	14
7.1	Observation schema.....	14
7.1.1	Property evaluation.....	14
7.1.2	Observation.....	15
7.1.3	Properties of an Observation.....	15
7.1.4	Observation location.....	16
7.1.5	Result types.....	16
7.1.6	Use of the observation model.....	16
7.2	Sample schema.....	17
7.2.1	Role of sample features.....	17
7.2.2	Proximate vs. ultimate feature-of-interest.....	17
7.2.3	Role of samples.....	18
7.2.4	Sampling process.....	18
7.2.5	Classification of samples.....	19
7.3	Alignment between Observation, Sample and domain models.....	19
7.3.1	Model consistency.....	19
7.3.2	Relationship between Sample and domain features.....	22
8	Conceptual Observation schema.....	25
8.1	General.....	25
8.1.1	Conceptual Observation model.....	25
8.1.2	Conceptual Observation schema package Requirements Class.....	26
8.1.3	Association relatedObservation.....	26

8.2	Observation	27
8.2.1	Observation Requirements Class	27
8.2.2	Interface Observation	27
8.2.3	Attribute phenomenonTime	28
8.2.4	Attribute resultTime	28
8.2.5	Attribute validTime	28
8.2.6	Association featureOfInterest	29
8.2.7	Association observedProperty	29
8.2.8	Association result	29
8.2.9	Association observingProcedure	30
8.2.10	Association observer	30
8.2.11	Association host	30
8.2.12	Constraint Observer or Host	30
8.2.13	Constraint ObservableProperty characteristic associated with featureOfInterest	30
8.2.14	Constraint suitable ObservableProperty	30
8.2.15	Constraint suitable result type	30
8.2.16	Constraint unit of measure	31
8.3	ObservableProperty	31
8.3.1	ObservableProperty Requirements Class	31
8.3.2	Interface ObservableProperty	31
8.3.3	Association observer	32
8.4	Procedure	32
8.4.1	Procedure Requirements Class	32
8.4.2	Interface Procedure	32
8.5	ObservingProcedure	32
8.5.1	ObservingProcedure Requirements Class	32
8.5.2	Interface ObservingProcedure	32
8.5.3	Association observer	33
8.6	Observer	33
8.6.1	Observer Requirements Class	33
8.6.2	Interface Observer	33
8.6.3	Association observableProperty	34
8.6.4	Association observingProcedure	34
8.6.5	Association deployment	34
8.7	Host	34
8.7.1	Host Requirements Class	34
8.7.2	Interface Host	34
8.7.3	Association deployment	35
8.7.4	Association relatedHost	35
8.8	Deployment	35
8.8.1	Deployment Requirements Class	35
8.8.2	Interface Deployment	35
8.8.3	Association observer	35
8.8.4	Association host	35
9	Abstract Observation Core	36
9.1	General	36
9.1.1	Abstract Observation Core Package Requirements Class	36
9.1.2	Association metadata	36
9.2	AbstractObservationCharacteristics	36
9.2.1	AbstractObservationCharacteristics Requirements Class	36
9.2.2	Feature type AbstractObservationCharacteristics	38
9.2.3	Attribute observationType	39
9.2.4	Attribute parameter	39
9.2.5	Attribute resultQuality	39
9.2.6	Association proximateFeatureOfInterest	40
9.2.7	Association ultimateFeatureOfInterest	40
9.2.8	Association collection	41

9.3	AbstractObservation	41
9.3.1	AbstractObservation Requirements Class	41
9.3.2	Constraint observationType	42
9.3.3	Constraint resultTime instant	42
9.3.4	Constraint parameter unique name	42
9.3.5	Constraint proximate or ultimate featureOfInterest	42
9.3.6	Constraint Observer or Host	42
9.3.7	Constraint ObservableProperty characteristic associated with featureOfInterest	42
9.3.8	Constraint suitable ObservableProperty	42
9.3.9	Constraint suitable result type	42
9.4	AbstractObservableProperty	42
9.4.1	AbstractObservableProperty Requirements Class	42
9.5	AbstractObservingProcedure	43
9.5.1	AbstractObservingProcedure Requirements Class	43
9.6	AbstractObserver	45
9.6.1	AbstractObserver Requirements Class	45
9.7	AbstractHost	46
9.7.1	AbstractHost Requirements Class	46
9.8	AbstractDeployment	47
9.8.1	AbstractDeployment Requirements Class	47
9.8.2	Attribute deploymentReason	48
9.8.3	Attribute deploymentTime	49
9.9	AbstractObservationCollection	49
9.9.1	AbstractObservationCollection Requirements Class	49
9.9.2	Feature type AbstractObservationCollection	50
9.9.3	Attribute collectionType	50
9.9.4	Association member	51
9.9.5	Association memberCharacteristics	51
9.9.6	Association relatedCollection	51
9.10	NamedValue	51
9.10.1	NamedValue Requirements Class	51
9.10.2	Data type NamedValue	51
9.10.3	Attribute name	51
9.10.4	Attribute value	52
9.11	Codelists	52
9.11.1	AbstractObservationType	52
9.11.2	AbstractObservationCollectionType	52
10	Basic Observations	52
10.1	General	52
10.1.1	Basic Observations Package Requirements Class	52
10.1.2	Attribute link	53
10.1.3	Attribute location	53
10.2	Observation	53
10.2.1	Observation Requirements Class	53
10.3	ObservationCharacteristics	55
10.3.1	ObservationCharacteristics Requirements Class	55
10.4	ObservationCollection	55
10.4.1	ObservationCollection Requirements Class	55
10.5	ObservingCapability	55
10.5.1	ObservingCapability Requirements Class	55
10.5.2	Feature type ObservingCapability	57
10.6	ObservableProperty	58
10.6.1	ObservableProperty Requirements Class	58
10.7	ObservingProcedure	59
10.7.1	ObservingProcedure Requirements Class	59
10.8	Observer	61
10.8.1	Observer Requirements Class	61

10.9	Host	62
10.9.1	Host Requirements Class	62
10.10	Deployment	65
10.10.1	Deployment Requirements Class	65
10.11	GenericDomainFeature	66
10.11.1	GenericDomainFeature Requirements Class	66
10.11.2	Feature type GenericDomainFeature	69
10.12	Codelists	69
10.12.1	ObservationCollectionType	69
10.12.2	ObservationTypeByResultType	71
11	Conceptual Sample schema	72
11.1	General	72
11.1.1	Conceptual Sample schema model	72
11.1.2	Conceptual Sample Schema package Requirements Class	73
11.2	Sample	74
11.2.1	Sample Requirements Class	74
11.2.2	Interface Sample	74
11.2.3	Association sampling	74
11.2.4	Association preparationStep	75
11.2.5	Association sampledFeature	75
11.2.6	Association relatedSample	75
11.3	Sampling	75
11.3.1	Sampling Requirements Class	75
11.3.2	Interface Sampling	76
11.3.3	Association sample	76
11.3.4	Association featureOfInterest	76
11.3.5	Association sampler	76
11.3.6	Association samplingProcedure	77
11.3.7	Association relatedSampling	77
11.4	Sampler	77
11.4.1	Sampler Requirements Class	77
11.4.2	Interface Sampler	77
11.4.3	Association sampling	77
11.4.4	Association implementedProcedure	78
11.5	PreparationStep	78
11.5.1	PreparationStep Requirements Class	78
11.5.2	Interface PreparationStep	78
11.5.3	Association processingDetails	78
11.5.4	Association preparedSample	78
11.6	PreparationProcedure	78
11.6.1	PreparationProcedure Requirements Class	78
11.6.2	Interface PreparationProcedure	79
11.6.3	Association samplePreparationStep	79
11.7	SamplingProcedure	79
11.7.1	SamplingProcedure Requirements Class	79
11.7.2	Interface SamplingProcedure	79
11.7.3	Association sampling	79
11.7.4	Association sampler	80
12	Abstract Sample Core	80
12.1	General	80
12.1.1	Abstract Sample Core Package Requirements	80
12.2	AbstractSample	80
12.2.1	AbstractSample Requirements Class	80
12.2.2	Attribute sampleType	82
12.2.3	Attribute parameter	82
12.3	AbstractSampling	82
12.3.1	AbstractSampling Requirements Class	82

12.3.2	Attribute samplingLocation	83
12.3.3	Attribute time	83
12.3.4	Attribute parameter	83
12.4	AbstractSampler	84
12.4.1	AbstractSampler Requirements Class	84
12.4.2	Attribute samplerType	85
12.5	AbstractSamplingProcedure	86
12.5.1	AbstractSamplingProcedure Requirements Class	86
12.6	AbstractPreparationProcedure	87
12.6.1	AbstractPreparationProcedure Requirements Class	87
12.7	AbstractPreparationStep	88
12.7.1	AbstractPreparationStep Requirements Class	88
12.7.2	Attribute description	89
12.7.3	Attribute time	89
12.8	Codelists	89
12.8.1	AbstractSampleType	89
12.8.2	AbstractSamplerType	89
13	Basic Samples	90
13.1	General	90
13.1.1	Basic Samples Package Requirements Class	90
13.2	Sample	90
13.2.1	Sample Requirements Class	90
13.3	SpatialSample	92
13.3.1	SpatialSample Requirements Class	92
13.3.2	Feature type SpatialSample	92
13.3.3	Attribute shape	92
13.3.4	Attribute horizontalPositionalAccuracy	93
13.3.5	Attribute verticalPositionalAccuracy	93
13.4	MaterialSample	93
13.4.1	MaterialSample Requirements Class	93
13.4.2	Feature type MaterialSample	93
13.4.3	Attribute size	94
13.4.4	Attribute storageLocation	94
13.4.5	Attribute sourceLocation	94
13.5	StatisticalSample	94
13.5.1	StatisticalSample Requirements Class	94
13.5.2	Feature type StatisticalSample	95
13.5.3	Attribute classification	95
13.6	Sampling	95
13.6.1	Sampling Requirements Class	95
13.7	Sampler	96
13.7.1	Sampler Requirements Class	96
13.8	SamplingProcedure	97
13.8.1	SamplingProcedure Requirements Class	97
13.9	PreparationProcedure	99
13.9.1	PreparationProcedure Requirements Class	99
13.10	PreparationStep	100
13.10.1	PreparationStep Requirements Class	100
13.11	SampleCollection	102
13.11.1	SampleCollection Requirements Class	102
13.11.2	Feature type SampleCollection	102
13.11.3	Association member	103
13.11.4	Association relatedCollection	103
13.12	PhysicalDimension	103
13.12.1	PhysicalDimension Requirements Class	103
13.12.2	Data type PhysicalDimension	103
13.12.3	Attribute dimension	103
13.12.4	Attribute value	103

13.13	NamedLocation	104
13.13.1	NamedLocation Requirements Class	104
13.13.2	Data type NamedLocation	104
13.13.3	Attribute address	104
13.13.4	Attribute name	104
13.13.5	Attribute representativeGeometry	104
13.14	StatisticalClassification	104
13.14.1	StatisticalClassification Requirements Class	104
13.14.2	Data type StatisticalClassification	105
13.14.3	Attribute concept	105
13.14.4	Attribute classification	105
13.15	Codelists	105
13.15.1	SampleTypeByGeometryType	105
Annex A (normative) Abstract test suite		107
Annex B (informative) Common usage of OMS concepts		117
Annex C (informative) Changes in the Observation and Sample models between ISO 19156:2011 and ISO 19156:2023 (this document)		121
Annex D (informative) Best practices in use of the Observation and Sampling models		139
Annex E (informative) Detailed package overview diagrams		147
Bibliography		150