

WISE GIS Guidance

Guidance on the reporting of spatial data
to the Water Information System for Europe (WISE)

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Quick Start

1. The following WISE reference spatial data sets are required:
 - River basin districts
 - River basin district sub-units
 - Surface water bodies
 - Groundwater bodies
 - Monitoring sites
 - Protected areas
2. The geometry of surface water bodies must be reported using polygons, except for river water bodies. The geometry of river water bodies can be reported using polygons or polylines (as appropriate for a given water body). If applicable, separate files must be provided for each geometry type. A given water body should be represented by a given geometry type (polygon or polyline). Multi-part geometries of the same type are allowed.
3. The geometry of protected areas must be reported as polygons, polylines or points (as appropriate for a given protected area). If applicable, separate files must be provided for each geometry type. A given protected area should be represented by a given geometry type (polygon or polyline or point). Multi-part geometries of the same type are allowed.
4. Two additional data sets allow the reporting of:
 - The centrelines of surface water bodies, forming a hydrographic network;
 - The delineation of horizons, for groundwater bodies that have different horizons.
5. The quality of the data sets must be evaluated by the Data Providers before the submission. Attention must be paid to the spatial alignment across national and international borders for the purpose of producing a harmonised European level dataset. Reference data sets are available to support this alignment.
6. The coordinate reference system for spatial data must be ETRS89-GRS80 or ETRS89-LAEA. For areas outside the scope of ETRS89, WGS84 must be used.
7. Metadata must be provided for each spatial data file, according to the INSPIRE metadata profile.
8. The spatial data files must be submitted as valid GML files, conformant with the schemas available in the Data Dictionary schemas (<http://dd.eionet.europa.eu/schemasets/browse/>).
9. The spatial data files can be prepared as shapefiles. The shapefile templates available in the help page must be used (see <https://cdr.eionet.europa.eu/help/WFD/>). The shapefiles must be converted to GML when uploaded to the appropriate envelope in Reportnet's Central Data Repository.
10. The spatial data files must follow the naming convention defined in this document.
11. Spatial data must be submitted as complete national datasets (i.e. in a single national data set and not separated per river basin district).
12. For the 2022 Water Framework Directive reporting, submissions to Reportnet must be completed no later than the 22nd March 2022.

Quick reference card

The quick reference card shows the relationships between the INSPIRE Directive themes ([AM](#), [EF](#), [HY](#) and [SU](#)) and elements and the WISE data sets and elements (in GML format and in the shapefile format).

INSPIRE theme	INSPIRE element	#	WISE GML data element	MonitoringSite	RiverBasinDistrict	SubUnit	SurfaceWaterBody	SurfaceWaterBodyLine	GroundWaterBody	ProtectedArea	ProtectedAreaLine	ProtectedAreaPoint	GroundWaterBodyHorizon	SurfaceWaterBodyCentreline	Shapefile field name
AM EF	geometry	1	geometry	m	m	m	m	m	m	m	m	m	m	m	shape
AM EF	inspireId	2	inspireIdLocalId	m	m	m	m	m	m	m	m	m			localId
		3	inspireIdNamespace												namespace
		4	inspireIdVersionId	c	c	c	c	c	c	c	c	c			versionId
AM	thematicId	5	thematicIdIdentifier	m	m	m	m	m	m	m	m	m	m	c	thematicId
		6	thematicIdIdentifierScheme												themaldSch
(from HY)	hydroid	7	hydroidLocalId											m	hydroid
		8	hydroidNamespace												namespace
AM EF	beginLifespanVersion	9	beginLifespanVersion	c	c	c	c	c	c	c	c	c			beginLife
AM EF	endLifespanVersion	10	endLifespanVersion	c	c	c	c	c	c	c	c	c			endLife
(concept from SU)	predecessors	11	predecessorsIdentifier		c	c	c	c	c	c	c	c			predecessId
		12	predecessorsIdentifierScheme												predeldSch
(concept from SU)	successors	13	successorsIdentifier		c	c	c	c	c	c	c	c			successId
		14	successorsIdentifierScheme												succeldSch
EF	supersedes	15	supersedesIdentifier	c											predecessId
		16	supersedesIdentifierScheme												predeldSch
EF	supersededBy	17	supersededByIdentifier	c											successId
		18	supersededByIdentifierScheme												succeldSch
(concept from SU)	evolutions	19	wiseEvolutionType	m	m	m	m	m	m	m	m	m			wEvolution
AM EF	name	20	nameTextInternational	m	m	m	m	m	m	m	m	m			nameTxtInt
		21	nameText	m	m	m	m	m	m	m	m	m			nameText
		22	nameLanguage	m	m	m	m	m	m	m	m	m			nameTxtLan
from HY	geographicalName	23	geographicalNameText											m	geonameTxt
		24	geographicalNameLanguage												geonamTxtL
AM	designationPeriod	25	designationPeriodBegin		m	m	m	m	m	m	m	m			desigBegin
		26	designationPeriodEnd		c	c	c	c	c	c	c	c			desigEnd
EF	operationalActivity	27	operationalActivityPeriodBegin	m											opActBegin
		28	operationalActivityPeriodEnd	c											opActEnd
AM	zoneType	29	zoneType		m	m	m	m	m	m	m	m			zoneType
AM	specialisedZoneType	30	specialisedZoneType			m	m	m	m	c	c	c			spZoneType
AM	legalBasis	31	legalBasisName												legisName
		32	legalBasisLink		o	o	o	o	o	m	m	m			legisLink
		33	legalBasisLevel												legisLevel
AM	relatedZone	34	relatedZoneIdentifier			m	m	m	m	o	o	o			rZoneld
		35	relatedZoneIdentifierScheme												rZoneldSch
AM	relatedZone	36	relatedZoneTransboundaryIdentifier			o	o	o	o	o					rTrnsId
		37	relatedZoneTransboundaryIdentifierScheme												rTrnsIdSch
EF	featureOfInterest	38	featureOfInterestIdentifier	m											foild
		39	featureOfInterestIdentifierScheme												foildSch
EF	relatedTo	40	relatedToIdentifier	o											rSiteld
		41	relatedToIdentifierScheme												rSiteldSch
EF	mediaMonitored	42	mediaMonitoredBiota	m											mediaBiota
		43	mediaMonitoredWater												mediaWater
		44	mediaMonitoredSediment												mediaSedim
EF	purpose	45	purpose	o											purpose
		46	catchmentArea	o											catchArea
		47	maximumDepth	o											maxDepth
		48	confidentialityStatus	m											confStatus
		49	sizeValue		o	o	c	o	o	o	o	o			sizeValue
		50	sizeUom												sizeUoM
		51	meanDepth				o	o							meanDepth
		52	horizons						c						horizons
		53	horizon										m		horizon
		54	continua											m	continua
		55	link	o	o	o	o	o	o	o	o	o			link

Legend:

m	Mandatory element, must be reported
c	Conditional element, must be reported under specific circumstances
o	Optional element, can be reported

WISE Reporting obligations

WFD Spatial reporting

For Data Providers reporting under the Water Framework Directive, this document provides guidance about the preparation and reporting of spatial data. The GML schemas, *shapefile* templates and supporting documents are available in the WFD help page (see <http://cdr.eionet.europa.eu/help/WFD>).

If you need further assistance, please contact the WFD helpdesk at wfd.helpdesk@eionet.europa.eu.

In accordance with the WISE reporting arrangements, the Data Providers may update the data submitted to WISE at any time. The Data Providers should ensure that the latest, correct information is available in WISE since that will be used for compliance checking and publication.

The quality, accuracy and validation of the information and data in WISE is the responsibility of the Data Providers. Quality assurance and control processes will be carried out by the WISE partners. The Commission, the EEA or its contracted partners may contact the Data Providers in case there is an indication that any of the data may be erroneous or misleading. This may lead to a resubmission request to the Data Provider.

WISE-5 Spatial reporting

Data Providers that report under WISE-5 should also follow this GIS guidance. Exceptions or particular cases applicable to WISE-5 are described under specific sections of the GIS guidance.

Please refer to the information in the WISE-5 help page (http://cdr.eionet.europa.eu/help/WISE_SoE/wise5).

If you need assistance on issues not addressed in this document please contact the WISE SoE helpdesk at wisesoe.helpdesk@eionet.europa.eu.

Data content

This section provides an overview of the content of the different WISE spatial data sets and of the constraints and requirements applicable to the spatial objects and their relationships. Examples are provided to clarify some specific situations.

River basin districts and sub-units

Definitions

Table 1. Definitions relevant for the RiverBasinDistrict and the SubUnit data sets.

Concept	Definition	Related data sets
River basin district	The area of land and sea, made up of one or more neighbouring river basins together with their associated groundwaters and coastal waters, which is the main unit for management of river basins.	RiverBasinDistrict, SubUnit
River basin	The area of land from which all surface run-off flows through a sequence of streams, rivers and, possibly, lakes into the sea at a single river mouth, estuary or delta.	RiverBasinDistrict, SubUnit
Sub-basin	The area of land from which all surface run-off flows through a series of streams, rivers and, possibly, lakes to a particular point in a water course (normally a lake or a river confluence).	SubUnit
Sub-unit	[Operational definition. Not in the WFD] Reporting unit. River basin districts larger than 50000 square kilometre should be divided into comparable sub-units with an area between 5000 and 50000 square kilometre. The sub-units should be created using river basins (if more than one river basin exists in the RBD), set of contiguous river basins, or sub-basins, for example. If the RBD area is less than 50000 square kilometre, the RBD itself should be used as a sub-unit.	SubUnit

Reporting river basin districts and sub-units

River basin districts are reported in the RiverBasinDistrict data set.

Sub-units are reported in the SubUnit data set.

Constraints and quality control

The RiverBasinDistrict data set must form a complete tessellation of the national territory to the limit of the coastal waters (i.e. 1 nautical mile for the territorial waters baseline).

13. Each sub-unit must be assigned to one and only river basin district.

14. Each sub-unit polygon must be contained by its river basin district polygon.

15. The SubUnit data set must form a complete tessellation with the same spatial coverage of the RiverBasinDistrict data set.

Note 1: In a tessellation, the polygons must fill the plane with no gaps, overlaps or self-intersecting boundaries.

Note 2: If a given river basin district has not been divided into sub-units, Data Providers are requested to report the geometry of the river basin district as a sub-unit. This facilitates the data processing and quality control of the delivered spatial data set.

Note 3: Countries reporting under WFD Spatial may find more information on sub-units in the "Report on sub-units – version 5, 31 January 2008. Paper prepared for the meeting of the CIS Working Group Reporting." <https://circabc.europa.eu/w/browse/4b0e9c5d-f5b0-410e-a721-7ae90c8ef844>

Note 4: As a corollary of the constraints in §1 and §4, the geometry of RiverBasinDistrict and the SubUnit must not contain nor overlap the geometry of territorial waters.

Special case: reporting river basins under WISE-5

For Data Providers not reporting under the WFD Spatial dataflow, a RiverBasinDistrict data set and a SubUnit data set is requested under WISE-5.

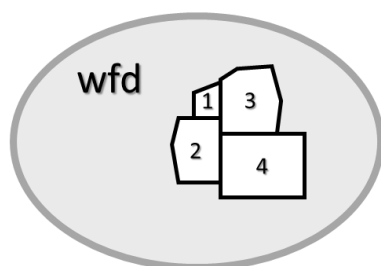
These data sets will provide the necessary spatial reference for the data reported in the Emissions (WISE-1) and the Water Quantity (WISE-3) data flows, and will also allow European-wide comparisons to be made, using a similar structure to that available for EU Member States, Iceland and Norway.

In the context of WISE-5, river basin districts are reporting units created from contiguous sets of river basins (and sub-units should be defined according to criteria similar to those proposed in the WFD).

Figure 1 illustrates the reporting of the RiverBasinDistrict spatial reference data set required for WFD and WISE-5: in practice, only the thematic identifier scheme changes. Please refer to the section on “Identifier management” for further information.

Figure 1. Reporting of river basins for two hypothetical countries: country XZ reporting under WFD Spatial; and country ZZ reporting only under WISE-5.

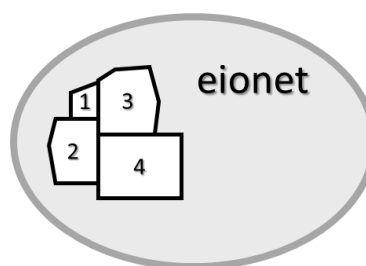
Country XZ



thematicID Identifier	thematicID IdentifierScheme
XZ1	euRBDCode
XZ2	euRBDCode
XZ3	euRBDCode
XZ4	euRBDCode

Note: report only under WFD !

Country ZZ



thematicID Identifier	thematicID IdentifierScheme
ZZ1	eionetRBDCode
ZZ2	eionetRBDCode
ZZ3	eionetRBDCode
ZZ4	eionetRBDCode

Note: report only under WISE-5 !

Surface water bodies

Definitions

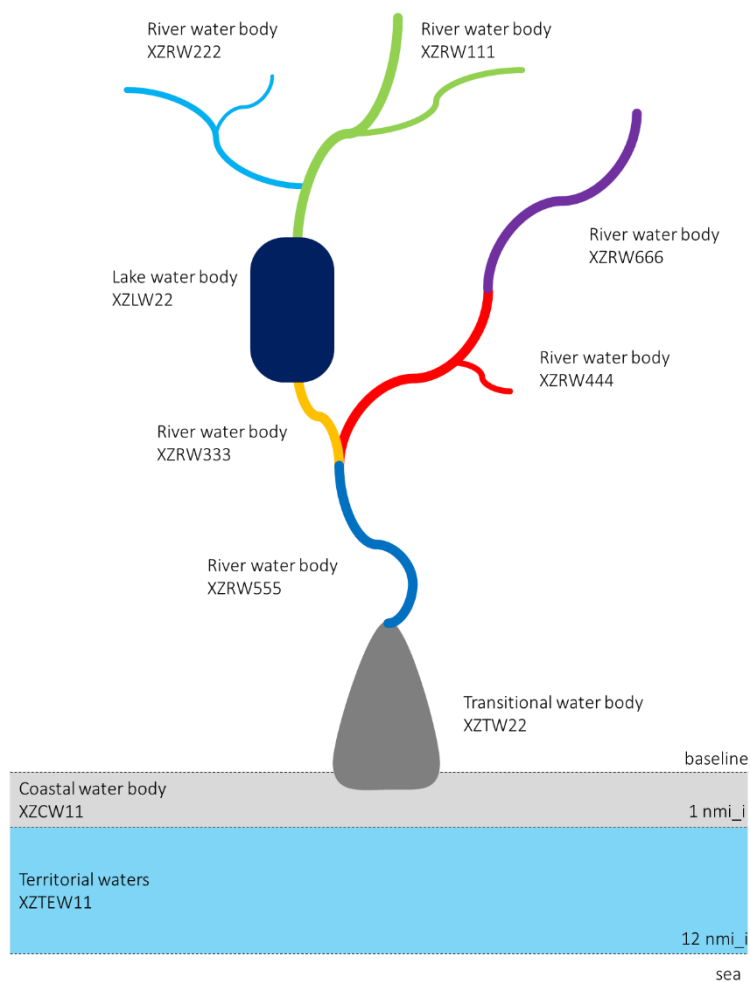
Table 2. Definitions relevant for the SurfaceWaterBody, SurfaceWaterBodyLine and SurfaceWaterBodyCentreline data sets.

Concept	Definition	Related data sets
Surface water body	Body of surface water means a discrete and significant element of surface water such as a lake, a reservoir, a stream, river or canal, part of a stream, river or canal, a transitional water or a stretch of coastal water.	SurfaceWaterBody, SurfaceWaterBodyLine, SurfaceWaterBodyCentreline
Surface water	Inland waters, except groundwater; transitional waters and coastal waters, except in respect of chemical status for which it shall also include territorial waters.	SurfaceWaterBody, SurfaceWaterBodyLine, SurfaceWaterBodyCentreline
Inland water	All standing or flowing water on the surface of the land, and all groundwater on the landward side of the baseline from which the breadth of territorial waters is measured.	SurfaceWaterBody, SurfaceWaterBodyLine, SurfaceWaterBodyCentreline, GroundWaterBody, GroundWaterBodyHorizon
Territorial sea	The territorial waters, or territorial sea as defined by the 1982 United Nations Convention on the Law of the Sea, extend up to a limit not exceeding 12 nautical miles (22.2 km), measured from the baseline. The normal baseline is the low-water line along the coast.	
Territorial waters	[Operational definition. Not in WFD.] Reporting unit. The zone between the limit of the coastal water bodies and the limit of the territorial sea, can be geometrically subdivided in polygons according to proximity to the adjacent coastal sub-unit (i.e. creating a Voronoi partition) or using any alternative delineation provided by the national competent authorities. Each reporting unit must be assigned to an adjacent sub-unit for the purpose of reporting the chemical status of the territorial waters under the Water Framework Directive.	SurfaceWaterBody
Coastal water	Surface water on the landward side of a line, every point of which is at a distance of one nautical mile on the seaward side from the nearest point of the baseline from which the breadth of territorial waters is measured, extending where appropriate up to the outer limit of transitional waters.	SurfaceWaterBody
Transitional waters	Bodies of surface water in the vicinity of river mouths which are partly saline in character as a result of their proximity to coastal waters but which are substantially influenced by freshwater flows.	SurfaceWaterBody, SurfaceWaterBodyLine, SurfaceWaterBodyCentreline
River	Body of inland water flowing for the most part on the surface of the land but which may flow underground for part of its course.	SurfaceWaterBody, SurfaceWaterBodyLine, SurfaceWaterBodyCentreline
Lake	Body of standing inland surface water.	SurfaceWaterBody, SurfaceWaterBodyLine, SurfaceWaterBodyCentreline
Artificial water body	Body of surface water created by human activity.	SurfaceWaterBody, SurfaceWaterBodyLine, SurfaceWaterBodyCentreline
Heavily modified water body	Body of surface water which as a result of physical alterations by human activity is substantially changed in character, as designated by the Member State in accordance with the provisions of Annex II of the Water Framework Directive.	SurfaceWaterBody, SurfaceWaterBodyLine, SurfaceWaterBodyCentreline

Reporting surface water bodies

The diagram in Figure 2 will be used in the examples.

Figure 2. Surface water bodies represented by different geometries.



Reporting surface water bodies using the SurfaceWaterBody data set

If the geometry is a polygon, then the water body must be reported in the SurfaceWaterBody data set.

The geometry of lakes, transitional and coastal water bodies must be reported using polygons. The geometry of a river water body can be reported using a polygon or a polyline. If the river geometry is reported using a polygon, provide an estimate of the total length in kilometres using the **sizeValue** and **sizeUom** attributes (the total length of the centrelines can be used as an estimate).

Figure 3. Polygon geometries to be included in the SurfaceWaterBody data set.

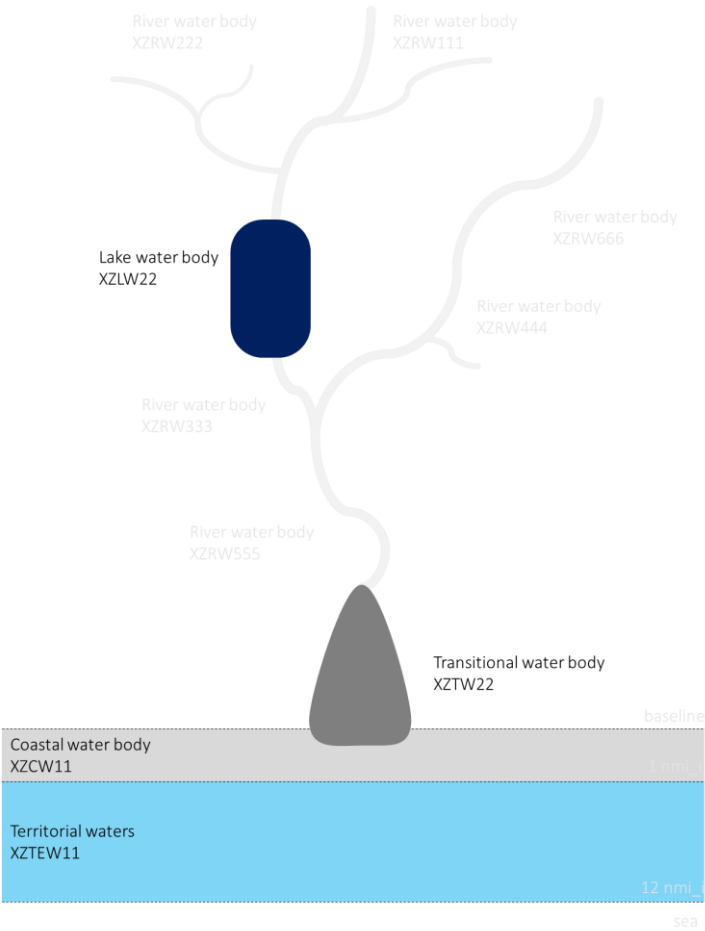






Figure 4. Geometry and thematic identifier in the SurfaceWaterBody data set (see also Figure 3).

geometry	thematicID Identifier	thematicID IdentifierScheme
	XZRLW22	euSurfaceWaterBodyCode
	XZTW22	euSurfaceWaterBodyCode
	XYCW11	euSurfaceWaterBodyCode
	XYTEW11	euSurfaceWaterBodyCode

Reporting surface water bodies using the SurfaceWaterBodyLine data set

If the geometry is linear, then the water body must be reported in the SurfaceWaterBodyLine data set. Only river water bodies are expected in the SurfaceWaterBodyLine data set. Only one type of geometry can be used for a given river (i.e. either use polygons or use polylines, but do not use different types of geometry for different parts of the same river water body).

Figure 5. Polyline geometries to be included in the SurfaceWaterBodyLine data set.

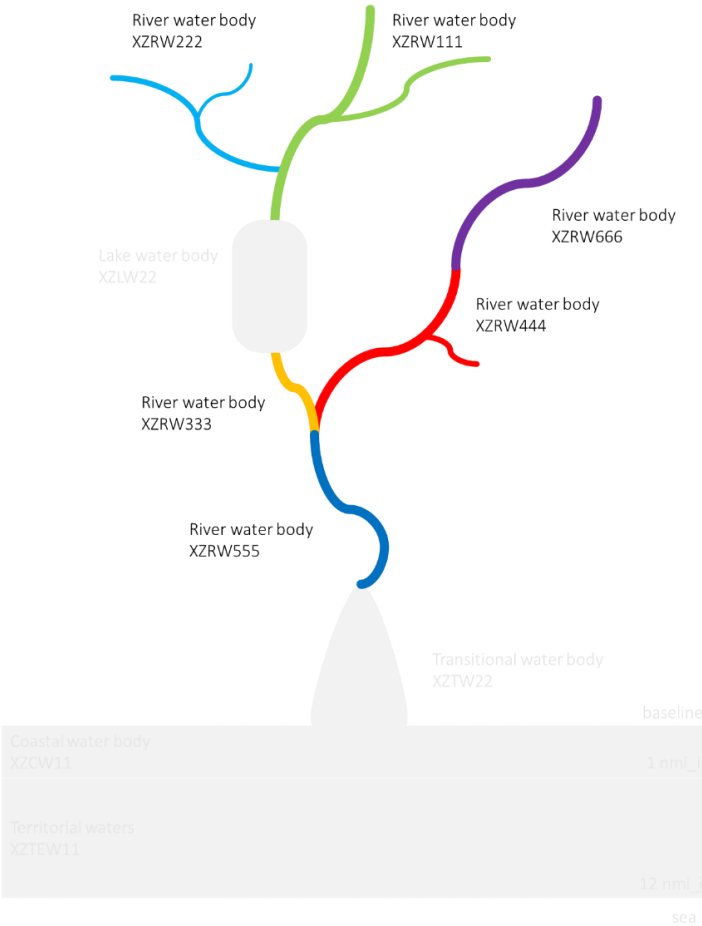








Figure 6. Geometry and thematic identifier in the SurfaceWaterBodyLine data set (see also Figure 5).

geometry	thematicID Identifier	thematicID IdentifierScheme
	XZRW111	euSurfaceWaterBodyCode
	XZRW222	euSurfaceWaterBodyCode
	XZRW333	euSurfaceWaterBodyCode
	XZRW444	euSurfaceWaterBodyCode
	XZRW555	euSurfaceWaterBodyCode
	XZRW555	euSurfaceWaterBodyCode

Constraints and quality control

1. Each surface water body must be assigned to one and only sub-unit.
2. Surface water bodies must not overlap each other. This requirement applies regardless of the reference geometry: polygons must not overlap each other, line segments must not overlap each other (a node must exist at intersections) and finally lines and polygons cannot overlap each other. Adjacent water bodies must touch each other at vertices or nodes along a common boundary.
3. Each surface water body, with the exception of the territorial waters, must overlap or be contained by its sub-unit polygon.
4. Each surface water body, with the exception of coastal and territorial waters, must be contained by the river basin district polygon.
5. If the coastal water body is contained by the sub-unit, the common boundary between coastal waters and adjacent territorial waters must coincide with the seaward limit of the sub-unit.

Special case: reporting coastal waters

Coastal waters are represented by polygons and must be reported in the SurfaceWaterBody data set.

Coastal waters must be assigned to a sub-unit. This may involve the splitting of stretches of coastal water that might otherwise be considered as single water bodies. When assigning a stretch of coastal water to a River Basin District, the objective is to ensure that coastal waters are assigned to the closest possible or the most appropriate natural management unit and to minimise any unnecessary splitting of coastal stretches. To ensure consistency in the approach, the following principles should be applied:

- Where possible, existing boundaries should be used. Examples are ecoregions defined in the WFD and regions defined in the Marine Conventions;
- The boundaries between two adjacent types should be used wherever possible to minimise unnecessary splitting of the coastline;
- In the general case, the coastline should be split at open coast areas rather than through natural management units such as bays or inlets. However, specific situations may exist where the splitting of natural units for management purposes cannot be avoided.

Special case: reporting units for territorial waters

Territorial waters are treated as surface water bodies for reporting purposes only. Territorial waters are represented by polygons and must be reported in the SurfaceWaterBody data set.

The delineation of reporting units in the territorial waters zone, and their assignment to an adjacent sub-unit for reporting purposes, can be done by the competent national authorities according to the criteria best fitting the specific conditions of their territorial sea.

Figure 7 illustrates a simple geometric procedure whereby the territorial waters are subdivided in polygons according to their proximity to the adjacent coastal sub-unit (i.e. creating a Voronoi partition). Each reporting unit is then assigned to the adjacent sub-unit with which it shares the longest border. Note the omission of a reporting unit adjacent to the small XZSU22 sub-unit. This omission illustrates the possibility of merging neighbouring units (preferably only if the sub-units belong to the same RBD): the resulting XZTEW21 unit should be assigned to sub-unit XZSU21 (unless local conditions advice otherwise).

The geometry of the territorial waters must not overlap or be contained in the geometry of the sub-units or in the geometry of the river basin districts.

Figure 7. Illustrative delineation of territorial waters for reporting purposes.

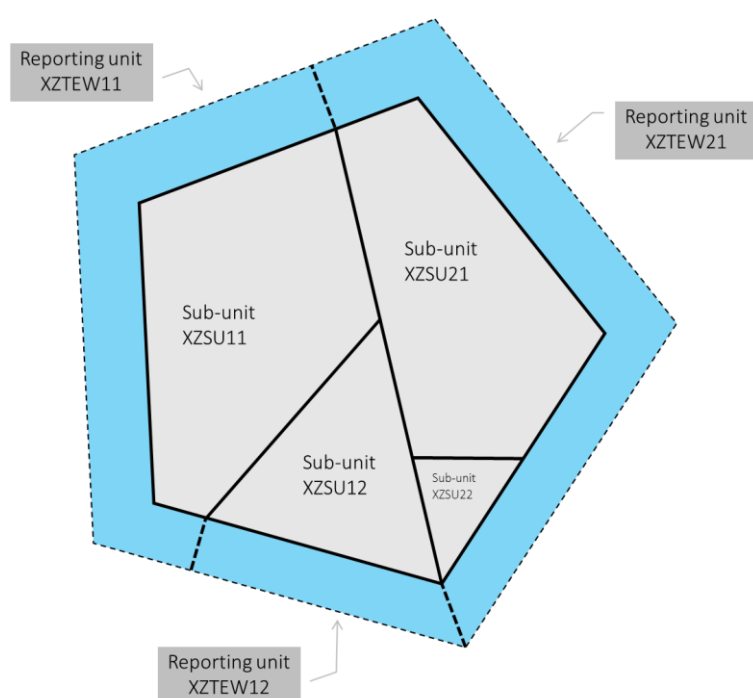


Figure 8. Reporting territorial waters and adjacent sub-units in the SurfaceWaterBody data set (see also Figure 7).

thematicID Identifier	thematicID IdentifierScheme	relatedZone Identifier	relatedZone IdentifierScheme
XZTEW11	euSurfaceWaterBodyCode	XZSU11	euSubUnitCode
XZTEW12	euSurfaceWaterBodyCode	XZSU12	euSubUnitCode
XZTEW21	euSurfaceWaterBodyCode	XZSU21	euSubUnitCode

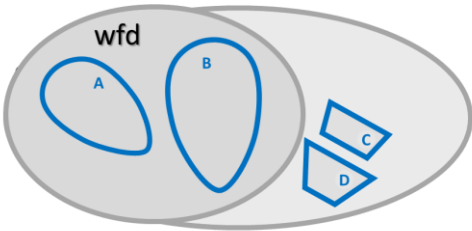
Special case: reporting surface water bodies under WISE-5

Countries not reporting under the WFD Spatial dataflow are requested to provide the delineation of EIONET water bodies under the WISE-5 dataflow, to provide the necessary spatial reference for the data reported in the Biology (WISE-2), Water Quality (WISE-4) or Water Quantity (WISE-3) data flows. Data Providers are also encouraged to report the geometry of the national water bodies (even if not monitored by EIONET monitoring sites) to allow an overview of the completeness of the spatial coverage of the EIONET data at national and European level.

Figure 9 illustrates the reporting of water bodies data under WFD Spatial and under WISE-5: in practice, only the thematic identifier scheme changes. Please refer to the section on “Identifier management” for further information.

Figure 9. Reporting of surface water bodies for two hypothetical countries: country XZ reporting under WFD; and country ZZ reporting only under WISE-5.

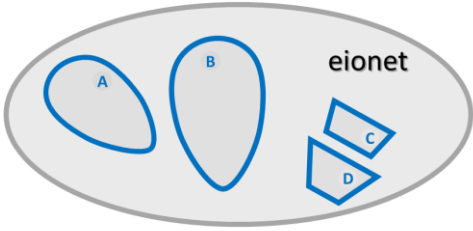
Country XZ



thematicID Identifier	thematicID IdentifierScheme
XZA	euSurfaceWaterBodyCode
XZB	euSurfaceWaterBodyCode

Note: report under WFD !

Country ZZ



thematicID Identifier	thematicID IdentifierScheme
ZZA	eionetSurfaceWaterBodyCode
ZZB	eionetSurfaceWaterBodyCode
ZZC	eionetSurfaceWaterBodyCode
ZZD	eionetSurfaceWaterBodyCode

Note: report only under WISE-5 !

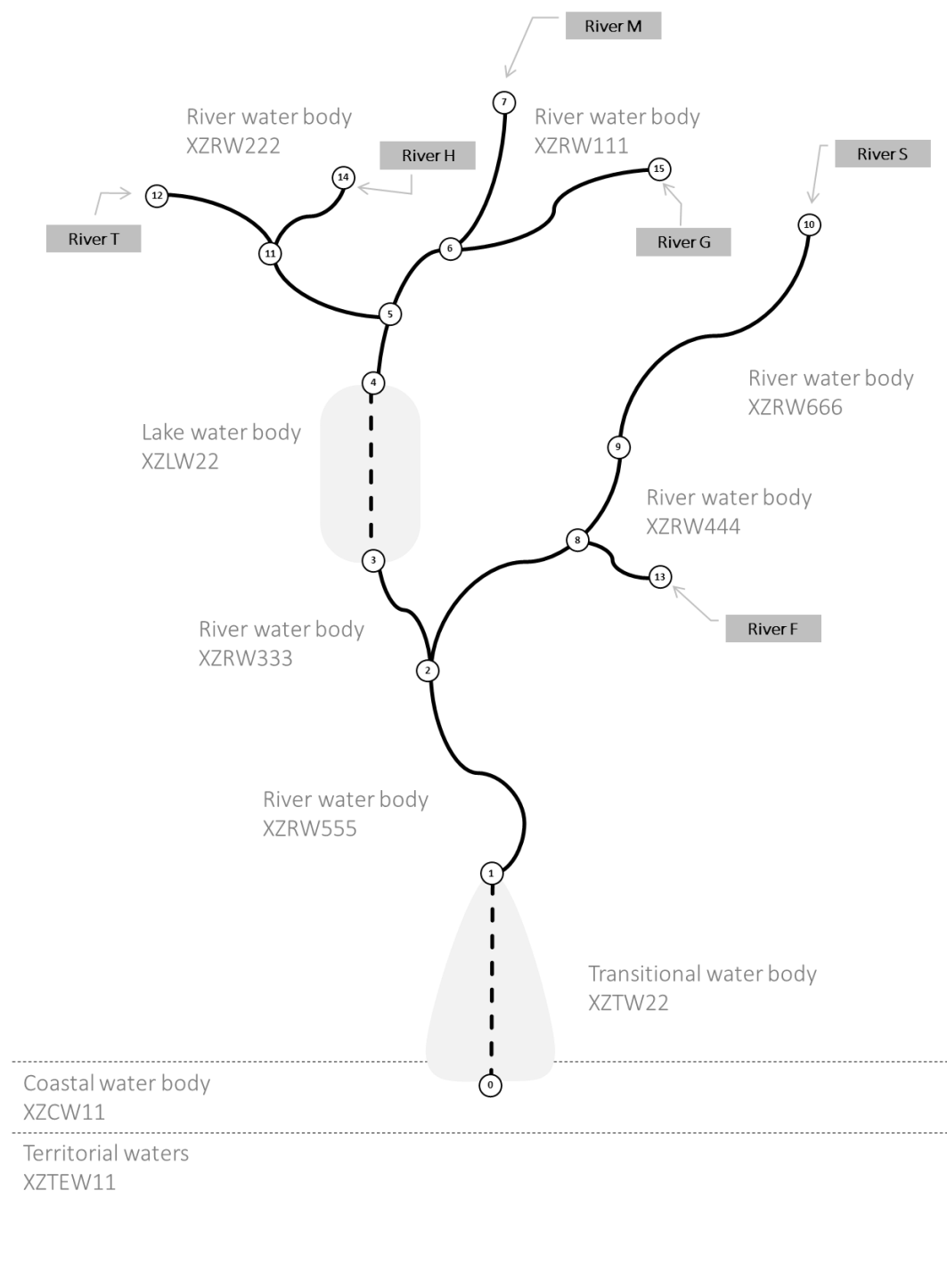
Reporting surface water body centrelines

In the scope of the WFD Spatial reporting, a representation of the centrelines of surface water bodies is requested. This hydrographic network must be reported in the SurfaceWaterBodyCentreline data set.

The centreline of each surface water bodies must be split into segments, such that each segment belongs to one and only one hydrographic feature.

The hydrographic code and the geographical name of the hydrographic feature must be reported.

Figure 10. Representation of the hydrographic network.



Each segment must be classified according to its type, using the **continua** element value:

- realSurfaceWaterSegment
- realUndergroundSegment
- virtualSegmentLake
- virtualSegmentToConnectTributary
- virtualSegmentTransitionalWater
- virtualSegmentCoastalWater
- virtualSegmentTerritorialWater
- virtualSegmentNotUnderOtherClassification

In the example in Figure 10, let it be assumed that:

- "River M" is the main river, flowing from node 7 to node 0;
- "River S" is a tributary of river M, flowing from node 10 to node 2;
- "River T" is a tributary of river M, flowing from node 12 to node 5;
- "River G" is a tributary of river M, flowing from node 15 to node 6;
- "River F" is a tributary of river S, flowing from node 13 to node 8;
- "River H" is a tributary of river T, flowing from node 14 to node 11.

Let it also be assumed that the hydrographic identifier of each centreline segment is simply the number of its initial node.

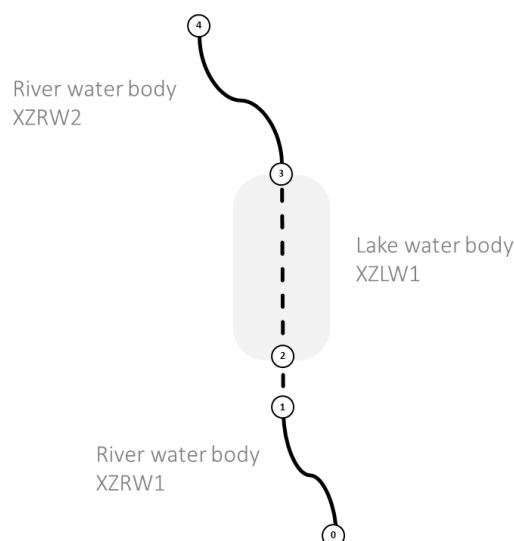
Table 3 presents the hydrographic network as it would be described in the SurfaceWaterBodyCentreline data set.

Table 3. Representation of the hydrographic network in the SurfaceWaterBodyCentreline data set (see also Figure 10).

thematicIdIdentifier	thematicIdIdentifierScheme	hydroIdLocalId	geographicalNameText	continua
XZTW22	euSurfaceWaterBodyCode	1	River M	virtualSegmentTransitionalWater
XZRW555	euSurfaceWaterBodyCode	2	River M	realSurfaceWaterSegment
XZRW333	euSurfaceWaterBodyCode	3	River M	realSurfaceWaterSegment
XZLW22	euSurfaceWaterBodyCode	4	River M	virtualSegmentLake
XZRW111	euSurfaceWaterBodyCode	5	River M	realSurfaceWaterSegment
XZRW111	euSurfaceWaterBodyCode	6	River M	realSurfaceWaterSegment
XZRW111	euSurfaceWaterBodyCode	7	River M	realSurfaceWaterSegment
XZRW444	euSurfaceWaterBodyCode	8	River S	realSurfaceWaterSegment
XZRW444	euSurfaceWaterBodyCode	9	River S	realSurfaceWaterSegment
XZRW666	euSurfaceWaterBodyCode	10	River S	realSurfaceWaterSegment
XZRW222	euSurfaceWaterBodyCode	11	River T	realSurfaceWaterSegment
XZRW222	euSurfaceWaterBodyCode	12	River T	realSurfaceWaterSegment
XZRW444	euSurfaceWaterBodyCode	13	River F	realSurfaceWaterSegment
XZRW122	euSurfaceWaterBodyCode	14	River H	realSurfaceWaterSegment
XZRW111	euSurfaceWaterBodyCode	15	River G	realSurfaceWaterSegment

Figure 11 illustrates the case where a virtual segment is required to reestablish the connectivity of the network. In the example, the lake water body XZLW1 is a reservoir represented by a polygon geometry and reported in the SurfaceWaterBody dataset. The river water bodies XZRW1 and XZRW2 are represented by polyline geometries and reported in the SurfaceWaterBodyLine dataset.

Figure 11. Surface water body centreline example: virtual segment not under classification.



Depending on the scale and the level of detail of the information, there may be a discontinuity between the geometry of the reservoir and the geometry of the downstream river, e.g. due to the presence of a dam.

In this case, the small virtual segment between node 1 and node 2 can be used to reestablish the connectivity, although that segment is not contained by either or the water bodies.

Table 4 presents the relevant attributes for the centrelines. Note the absence of the water body identifier and identifier scheme when the segment is classified as 'virtualSegmentNotUnderOtherClassification'. Note also that, in the example, these two elements must be present when the **continua** takes any other value.

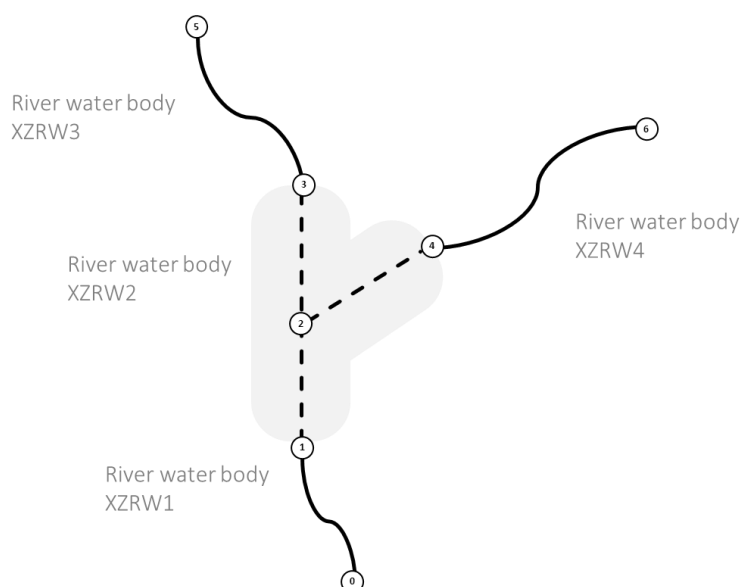
Table 4. Representation of the hydrographic network in the SurfaceWaterBodyCentreline data set (see also Figure 11).

thematicIdIdentifier	thematicIdIdentifierScheme	hydroIdLocalId	continua
XZRW1	euSurfaceWaterBodyCode	1	realSurfaceWaterSegment
		2	virtualSegmentNotUnderOtherClassification
XZLW1	euSurfaceWaterBodyCode	3	virtualSegmentLake
XZRW2	euSurfaceWaterBodyCode	4	realSurfaceWaterSegment

If the segment is a real hydrographic feature connecting WFD surface water bodies, but that does not belong to any WFD surface water body, do not report the **thematicIdIdentifier** (nor the **thematicIdIdentifierScheme**) and provide the value 'realSurfaceWaterSegment' (or 'realUndergroundSegment', if applicable) in the **continua** element.

Figure 12 illustrates a different situation. The river water body XZRW2 is represented by a polygon geometry and is reported in the SurfaceWaterBody dataset. The river water bodies XZRW1, XZRW3 and XZRW4 are represented by polyline geometries and are reported in the SurfaceWaterBodyLine dataset.

Figure 12. Surface water body centreline example: virtual segment to connect tributary.



When reporting the centrelines, a connection must be established between the different rivers, using virtual segments within the river water body XZRW2. Table 5 presents the relevant attributes for the centrelines.

Table 5. Representation of the hydrographic network in the SurfaceWaterBodyCentreline data set (see also Figure 12).

thematicIdIdentifier	thematicIdIdentifierScheme	hydroIdLocalId	continua
XZRW1	euSurfaceWaterBodyCode	1	realSurfaceWaterSegment
XZRW2	euSurfaceWaterBodyCode	2	virtualSegmentToConnectTributary
XZRW2	euSurfaceWaterBodyCode	3	virtualSegmentToConnectTributary
XZRW2	euSurfaceWaterBodyCode	4	virtualSegmentToConnectTributary
XZRW3	euSurfaceWaterBodyCode	5	realSurfaceWaterSegment
XZRW4	euSurfaceWaterBodyCode	6	realSurfaceWaterSegment

Constraints and quality control

1. In the SurfaceWaterBodyLine data set, each geometry may be composed of multiple parts.
2. In the SurfaceWaterBodyCentreline data set, the geometry of each segment must be represented by one line string (i.e. a sequence of line segments). Each geometry must have only one part.

From a geometric and topological point of view, the data quality requirements described in section 10.2 "Data capture for Network" of the INSPIRE Data Specification on Hydrography v3.1 are directly applicable to the SurfaceWaterBodyCentreline data set (with the exception of sections 10.2.8 and 10.2.9). Please refer to the INSPIRE Data Specification on Hydrography v3.1 for a complete description (http://inspire.ec.europa.eu/documents/Data_Specifications/INSPIRE_DataSpecification_HY_v3.1.pdf).

Groundwater bodies

Definitions

Table 6. Definitions relevant for the GroundWaterBody and GroundWaterBodyHorizon data set.

Concept	Definition	Related data sets
Groundwater body	'Body of groundwater' means a distinct volume of groundwater within an aquifer or aquifers.	GroundWaterBody, GroundWaterBodyHorizon
Groundwater	All water which is below the surface of the ground in the saturation zone and in direct contact with the ground or subsoil.	GroundWaterBody, GroundWaterBodyHorizon
Aquifer	Subsurface layer or layers of rock or other geological strata of sufficient porosity and permeability to allow either a significant flow of groundwater or the abstraction of significant quantities of groundwater.	GroundWaterBody, GroundWaterBodyHorizon

Reporting groundwater bodies using the GroundWaterBody data set

Groundwater bodies are represented by 2D polygon geometries (where the outer boundary is the horizontal projection of the extent of the groundwater body). Groundwater bodies are reported in the GroundWaterBody data set.

The geometry of a body of groundwater may overlap the geometry of more than one RBD in the national territory. However, one groundwater body must be assigned to one and only one river basin district. If the different parts are managed separately (e.g. require different measures or have different competent authorities) then the parts cannot be treated as a single water body and need to be split into different groundwater bodies (not necessarily along the geographical borders of the RBD but rather according to the different identification of measures). Please note that reporting the same water body twice, with the same geometry and different measures, in two different RBDs, is not possible.

The **horizons** element identifies the different horizons in the groundwater body – the different horizons must be reported as a comma-separated list of integer values. For example:

- If the groundwater body belongs to horizon 1, simply report '1'.
- If the groundwater body belongs to horizon 2 and 3, report '2,3'.
In this situation, the geometry of the part belonging to horizon 2 and the geometry of the part belong to horizon 3 should be reported in the GroundWaterBodyHorizon data set.

Please refer to Annex 4 in the WFD Reporting Guidance for further information on the delineation of groundwater bodies.

Constraints and quality control

1. Each groundwater body must be assigned to one and only River Basin District.
2. The groundwater body polygon must be contained by or overlap the River Basin District polygon.
3. The groundwater body polygon must be completely contained on the national territory.
4. Groundwater bodies may overlap each other (if at different depths).

Special case: reporting groundwater bodies under WISE-5

The GroundWaterBodyHorizon data set is not requested under WISE-5.

Only the GroundWaterBody data set is required, even if a given groundwater body has more than one horizon.

The principles described for surface water bodies are applicable to the reporting of groundwater bodies under WISE-5. Please refer to the section “Special case: reporting surface water bodies under WISE-5” (cf. page 11) for further information.

Reporting horizons using the GroundWaterBodyHorizon data set

If, and only if, a groundwater body has different horizons, then the GroundWaterBodyHorizon data set should be used to report the spatial delineation of each horizon. Please refer to the WFD Reporting Guidance for further information on the spatial delineation of groundwater horizons.

The **horizon** element identifies each of the horizons of a groundwater body, using a simple integer numeration (in the sense of the numerical position of the groundwater body starting with the first horizon from the surface).

Data Providers reporting under WISE-5 are not requested to provide this data set.

Constraints and quality control

1. The GroundWaterBodyHorizon data set must contain all the groundwater bodies that belong to two or more horizons.
2. In the GroundWaterBodyHorizon data set, at least two different parts must be reported for each groundwater body.
3. Each part of a given groundwater body must belong to a different horizon.
4. The geometry of each part of a given groundwater body may contain one or more spatially disjoint polygons.
5. The geometries of each part of a given groundwater body must not overlap.
6. The spatial union of the geometries of the each part of a given groundwater (in the GroundWaterBodyHorizon data set) must be equal to the geometry of the groundwater body (as reported in the GroundWaterBody data set).
7. For each part, the value in the horizon element (in the GroundWaterBodyHorizon data set) must match one of the values provided in the horizons element of the corresponding groundwater body (in the GroundWaterBody data set).

Monitoring sites

Definitions

Table 7. Definitions relevant to the MonitoringSite data set.

Concept	Definition	Related data sets
Monitoring site	<p>[Operational definition. Not in the WFD] Location used for the collection of data about physical-chemical, ecological, quantitative or other observable properties of a surface or groundwater body. Monitoring location included in a WFD surveillance, operational or investigative monitoring programme. Monitoring location included in the EIONET WISE SoE network.</p> <p>Data Providers reporting under WFD Spatial are requested to report WFD monitoring sites associated to water bodies designated under the Water Framework Directive.</p> <p>Data Providers reporting under WISE-5 are requested to report active monitoring sites associated to EIONET water bodies, for which time series are being reported.</p>	MonitoringSite

Reporting monitoring sites using the MonitoringSite data set

Important note:

Monitoring sites associated with WFD water bodies can be reported under WFD Spatial dataflow. Sites must be included, if the monitoring site was used in the 3rd RBMP monitoring programmes or in the assessment of the status of waterbodies.

Monitoring sites associated with WFD water bodies should also be included in the WFD Spatial dataflow, if their identifiers are used to report data under other dataflows. This includes, for example, streamflow monitoring sites used by countries reporting under WFD Spatial, when the time series are reported under the [WISE SoE - Water Quantity \(WISE-3\)](#) dataflow.

All monitoring sites are reported in the MonitoringSite data set: this includes both surface water monitoring sites and groundwater monitoring sites.

The location of a monitoring site is always reported as a (representative) point.

Constraints and quality control

1. Each monitoring site must be associated to one and only one water body.
2. If the water body is represented by a polygon (i.e. if it is represented in the SurfaceWaterBody or GroundWaterBody data set), then the monitoring site representative point must be contained within the water body polygon.
3. If the water body is represented by a polyline (i.e. if it is represented in the SurfaceWaterBodyLine data set), then the monitoring site representative point should be within a 200 metre distance of the water body geometry.

Special case: reporting monitoring sites under WISE-5

For Data Providers reporting under the Water Framework Directive, the reporting of monitoring sites is expected under the WFD Spatial data flow.¹

Only sites located in WFD waterbodies should be reported.

Table 8 illustrates the reporting of a WFD monitoring site that had previously been reported as an EIONET site. The monitoring site is reported only once (under WFD Spatial).

It is not necessary to report it again in WISE-5.

Table 8. Reporting of former EIONET monitoring sites in the WFD reporting.

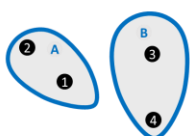
thematicIdIdentifier	thematicIdIdentifierScheme	relatedToIdentifier	relatedToIdentifierScheme
XZMS1	euMonitoringSiteCode	XZ5671-OLD-EIONET-CODE	eionetMonitoringSiteCode

Figure 13 illustrates the reporting of the monitoring sites under WFD Spatial and WISE-5: in practice, only the thematic identifier scheme changes.

Please refer to the section on “Identifier management” for further information.

Figure 13. Reporting of monitoring sites for two hypothetical countries: country XZ reporting under WFD Spatial; and country ZZ reporting under WISE-5.

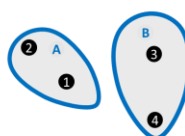
Country XZ



thematicID Identifier	thematicID IdentifierScheme	featureOfInterest Identifier	featureOfInterest IdentifierScheme
XZ1	euMonitoringSiteCode	XZA	euSurfaceWaterBodyCode
XZ2	euMonitoringSiteCode	XZA	euSurfaceWaterBodyCode
XZ3	euMonitoringSiteCode	XZB	euSurfaceWaterBodyCode
XZ4	euMonitoringSiteCode	XZB	euSurfaceWaterBodyCode

Note: report under WFD !

Country ZZ



thematicID Identifier	thematicID IdentifierScheme	featureOfInterest Identifier	featureOfInterest IdentifierScheme
ZZ1	eionetMonitoringSiteCode	ZZA	eionetSurfaceWaterBodyCode
ZZ2	eionetMonitoringSiteCode	ZZA	eionetSurfaceWaterBodyCode
ZZ3	eionetMonitoringSiteCode	ZZB	eionetSurfaceWaterBodyCode
ZZ4	eionetMonitoringSiteCode	ZZB	eionetSurfaceWaterBodyCode

Note: report under WISE-5 !

¹ Note that in 2nd RBMP reporting due in 2016, the definition of WFD monitoring site was different: a WFD monitoring site was a site monitoring a WFD water body *and included in a WFD monitoring programme*. The condition in *italics* part is no longer a requirement: for example, a monitoring site that was used for the 2nd RBMPs but not for the 3rd RBMPs can still be kept in the register of WFD monitoring sites. Furthermore, streamflow monitoring sites required for the reporting of data under [WISE SoE - Water Quantity \(WISE-3\)](#) can also be reported in the WFD national spatial datasets.

Protected areas

Protected areas must be represented by polygon, polyline or point geometries: use the ProtectedArea data set, the ProtectedAreaLine data set or the ProtectedAreaPoint data set accordingly.

Each type of protected area is identified using the **zoneType** value.

The **zoneType** values 'nitrateVulnerableZone', 'sensitiveArea' and 'bathingWaters' identify areas designated and reported under the Nitrates Directive, Urban Waste Water Treatment Directive and Bathing Waters Directive, respectively. The spatial data for these zone types are not reported under WFD.

The spatial data for areas protected and reported under the Habitats or Birds directive are not reported under the WFD.

Drinking water protection area

The **zoneType** value 'drinkingWaterProtectionArea' identifies an area protected under WFD Article 7(1).

The Drinking Water Directive 98/83/EC refers in its Monitoring Annex II to supply zones: "A supply zone is a geographically defined area within which water intended for human consumption comes from one or more sources and water quality may be considered as being approximately uniform". Member States may exempt very small supplies <10m³/day or serving <50 persons. Drinking water supplies/supply zones under Directive 98/83/EC are defined for drinking water monitoring purposes referring to uniform quality, and are not geographical areas for which spatial data has to be reported.

Member States practice varies in the designation of Drinking Water protected areas:

- Some Member States follow literally WFD Article 7 and designate as protected areas the water bodies used for the abstraction of water intended for human consumption (and those intended for such future use). Therefore there is no different spatial delineation of the protected areas: these are coincident with the WFD water bodies. Therefore, no reporting of spatial data under the WFD is expected in this case.
- Some Member States delineate the part of the water bodies which they consider are protected areas. The spatial extent of the protected areas can therefore be different, typically smaller than WFD water bodies. This is often the case in large groundwater bodies. In this case the Member State is required to report the spatial extent of the protected areas

Designated waters

For other protected areas, the **zoneType** element is 'designatedWaters' and the **specialisedZoneType** element is used to further distinguish different types: 'shellfishDesignatedWater', 'freshwaterFishDesignatedWater' or 'otherProtectedArea'.

- The Freshwater Fish Directive (2006/44/EC) was repealed by the WFD in 2013. The WFD Reporting Guidance recalls that "according to the WFD, the level of protection should be maintained through the inclusion of the designated areas as Protected Areas under WFD". In addition, "it is considered that the WFD objective of good ecological status integrates fully the objectives of the Fish Directive". Some Member States maintain the transposing legislation in order to maintain the same level of protection, and still consider this an important element in the protection of water resources. Spatial delineation of the protected areas under the Freshwater Fish Directive may or may not coincide with the delineation of the WFD water bodies. It is therefore possible to report the spatial extent of these protected areas. The reporting of this information is optional.

- The Shellfish Directive (2006/113/EC) was repealed by the WFD in 2013. As with the Freshwater Fish Directive, after the repeal, the WFD requires Member States to maintain the same level of protection. However, in the case of the Shellfish Directive, the WFD objective of good ecological status does not integrate fully the objectives of the Shellfish Directive. Indeed, "microbiological standards are essential for the quality of shellfish water", and these are not part of the definition of ecological status. Therefore, "it is requested to report if these standards have been set (or maintained from the shellfish water directive) and if they are met" (WFD Reporting Guidance 2016). Given that the Shellfish Directive is no longer in force and therefore there is no self-standing reporting mechanism to report the protected areas, the spatial extents of these protected areas must be reported under the WFD.

Special case: reporting protected areas under WISE-5

Data Providers reporting only under WISE-5 do not report the Protected Areas data sets.

Data quality

Data providers are recommended not to simplify or generalise the spatial data reported to WISE. The accuracy of the data should be documented in the metadata so that any further processing done in the production of the European reference data sets can respect the accuracy of the original data source.

Considering both WISE needs and the practical constraints of data availability, it is recommended that to report data with positional accuracy acceptable for cartographic representation at the 1:100000 scale or larger. The positional accuracy should always be kept as high as possible and ideally be similar to the national operational data sets.

Geodetic coordinates must be expressed in decimal degree, with a minimum recommended precision of 5 decimal places. Projected coordinates must be expressed in metre, with a minimum recommended precision of 1 decimal places. See the section on "Coordinate reference systems" for further information.

The quality of the data sets must be evaluated by the Data Providers before the submission.

For each dataset, the sections on "Constraints and quality control" express a number of requirements on the topology and/or spatial relationships between different types of spatial units. However, and to keep the model as simple as possible, topology is handled implicitly rather than explicitly. There is therefore a prerequisite for "implicit topology", i.e. the data provided should be sufficiently clean to support automated topological construction based on the reported geometry.

Reporting of fully consistent geometries across different datasets can be difficult due to inherent limitations in the original data sources or to discrepancies between the different data sources. For this reason, a spatial tolerance factor was introduced in some of the quality control checks.

For the tests listed in Table 9, if the test fails but the issue detected is within the spatial tolerance value, then the quality control raises an 'WARNING' but not a 'BLOCKER' (i.e. the data delivery can be released).

Data Providers are advised to check the WARNING and correct errors or systematic misalignments.

Attention must be paid to the spatial alignment across national and international borders for the purpose of producing a harmonised European level data set. Reference data sets are made available to support this alignment. Country boundaries are available at the [WISE restricted access area](#). Note that access is restricted to authorised [Water Framework Directive Data Reporters](#) and subject to use conditions (Figure 14).

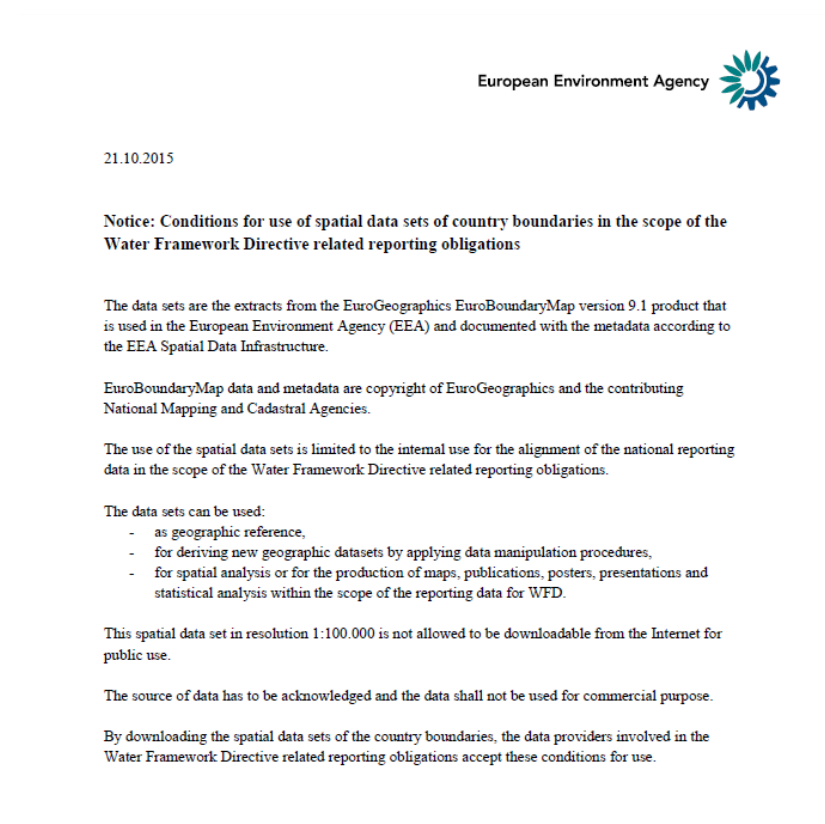
The EEA coastline for analysis is available at <http://www.eea.europa.eu/data-and-maps/data/eea-coastline-for-analysis-2> and may be used, subject to the constraints expressed in its metadata.

Table 9. Spatial quality control tests where a spatial tolerance value is applied

Source dataset	Target dataset	Message	Spatial tolerance
SubUnit	RiverBasinDistrict	The geometry of the subunit must be within the geometry of the associated river basin district.	If all the parts of the source geometry that are not within the target geometry have an area of less than 625 square metre, then only a 'WARNING' is raised.
SurfaceWaterBody	SubUnit	The geometry of the surface water body (except for coastal and territorial waters) must be within the geometry of the associated subunit.	If all the parts of the source geometry that are not within the target geometry have an area of less than 625 square metre, then only a 'WARNING' is raised.
SurfaceWaterBody	RiverBasinDistrict	The geometry of the surface water body (except for coastal and territorial waters) must be within the geometry of the associated river basin district.	If all the parts of the source geometry that are not within the target geometry have an area of less than 625 square metre, then only a 'WARNING' is raised.
SurfaceWaterBodyLine	SubUnit	The geometry of the surface water body must intersect the geometry of the associated subunit.	If all the parts of the source geometry that are not covered by the target geometry have a length of less than 25 square metre, then only a 'WARNING' is raised.
SurfaceWaterBodyLine	RiverBasinDistrict	The geometry of the surface water body must be covered by the geometry of the associated river basin district.	If all the parts of the source geometry that are not covered by the target geometry have a length of less than 25 square metre, then only a 'WARNING' is raised.
GroundWaterBody	RiverBasinDistrict	The geometry of the groundwater body must be within or covered by the geometry of the associated river basin district.	If all the parts of the source geometry that are not covered by the target geometry have a length of less than 25 square metre, then only a 'WARNING' is raised.
MonitoringSite	RiverBasinDistrict	The geometry of the monitoring site must not be disjoint of the geometry of the surface water body's river basin district (except for coastal and territorial waters).	If the distance between the source geometry and the target geometry is less than 25 metre, then only a 'WARNING' is raised.
ProtectedArea	RiverBasinDistrict	The geometry of the protected area must not be disjoint of the geometry of the surface water body's river basin district (except for coastal and territorial waters).	If the distance between the source geometry and the target geometry is less than 25 metre, then only a 'WARNING' is raised.
RiverBasinDistrict	RiverBasinDistrict	The geometry of the river basin districts must not overlap each other.	If all the parts of the source geometry that overlap the target geometry have an area of less than 625 square metre, then only a 'WARNING' is raised.
SubUnit	SubUnit	The geometry of the subunits must not overlap each other.	If all the parts of the source geometry that overlap the target geometry have an area of less than 625 square metre, then only a 'WARNING' is raised.
SurfaceWaterBody	SurfaceWaterBody	The geometry of polygon surface water bodies must not overlap each other.	If all the parts of the source geometry that overlap the target geometry have an area of less than 625 square metre, then only a 'WARNING' is raised.
SurfaceWaterBody	SurfaceWaterBodyLine	The geometry of polygon surface water bodies and the geometry of line surface water bodies must be disjoint or only touch at the boundary.	If all the parts of the geometry that are not disjoint have a length of less than 25 square metre, then only a 'WARNING' is raised.
SurfaceWaterBodyLine	SurfaceWaterBody	The geometry of polygon surface water bodies and the geometry of line surface water bodies must be disjoint or only touch at the boundary.	If all the parts of the geometry that are not disjoint have a length of less than 25 square metre, then only a 'WARNING' is raised.
SurfaceWaterBodyLine	SurfaceWaterBodyLine	The geometry of line surface water bodies must not overlap each other.	If all the parts of the geometry that are not disjoint have a length of less than 25 square metre, then only a 'WARNING' is raised.

Source dataset	Target dataset	Message	Spatial tolerance
GroundWaterBody	GroundWaterBody	Groundwater bodies at the same depth must not overlap.	If all the parts of the source geometry that overlap the target geometry have an area of less than 625 square metre, then only a 'WARNING' is raised.
GroundWaterBodyHorizon	GroundWaterBody	The spatial union of the geometries of the different horizons must be equal to the geometry of the groundwater body.	If all the parts of the source geometry that are not equal to the target geometry have an area of less than 625 square metre, then only a 'WARNING' is raised.
SurfaceWaterBodyCentrelines	SurfaceWaterBody	The geometry of a virtual line must be covered by the geometry of the polygon surface water body.	If all the parts of the geometry that are not covered have a length of less than 25 square metre, then only a 'WARNING' is raised.

Figure 14. Conditions for use of data sets of country boundaries in the scope of the WFD related reporting obligations.



Coordinate reference systems

The spatial data sets must be provided in one of the following coordinate reference systems (CRS):

- ETRS89-GRS80 (urn:ogc:def:crs:EPSG::4258)
- ETRS89-LAEA (urn:ogc:def:crs:EPSG::3035)
- WGS 84 (urn:ogc:def:crs:EPSG::4326)

The geometry of spatial objects should be reported in the ETRS89-GRS80 geodetic coordinate system (urn:ogc:def:crs:EPSG::4258). For areas outside the scope of ETRS89, such as overseas territories, WGS 84 (urn:ogc:def:crs:EPSG::4326) must be used.

The geometry of spatial objects may also be reported in the ETRS89-LAEA projected coordinate system (urn:ogc:def:crs:EPSG::3035). Again, an exception applies for areas outside the scope of ETRS89, where the geodetic coordinate system WGS 84 (urn:ogc:def:crs:EPSG::4326) must be used.

Note that for the quality control procedures applied to the spatial data, the ETRS89-LAEA projected coordinate system will be used.

Projection metadata files (.prj)

Valid projection metadata files (.prj) for the *shapefile* format are provided below:

- For ETRS89-GRS80 (urn:ogc:def:crs:EPSG::4258)

```
GEOGCS["ETRS89",DATUM["D_ETRS_1989",SPHEROID["GRS_1980",6378137.0,298.257222101]],PRIMEM["Greenwich",0.0],UNIT["Degree",0.0174532925199433]]
```

- For ETRS89-LAEA (urn:ogc:def:crs:EPSG::3035)

```
PROJCS["ETRS_1989_LAEA",GEOGCS["GCS_ETRS_1989",DATUM["D_ETRS_1989",SPHEROID["GRS_1980",6378137.0,298.257222101]],PRIMEM["Greenwich",0.0],UNIT["Degree",0.0174532925199433]],PROJECTION["Lambert_Azimuthal_Equal_Area"],PARAMETER["False_Easting",4321000.0],PARAMETER["False_Northing",3210000.0],PARAMETER["Central_Meridian",10.0],PARAMETER["Latitude_Of_Origin",52.0],UNIT["Meter",1.0]]
```

- For WGS 84 (urn:ogc:def:crs:EPSG::4326)

```
GEOGCS["GCS_WGS_1984",DATUM["D_WGS_1984",SPHEROID["WGS_1984",6378137.0,298.257223563]],PRIMEM["Greenwich",0.0],UNIT["Degree",0.0174532925199433]]
```


Metadata

A metadata file must be provided for each spatial data file. As defined in the “CIS Guidance Document No. 22”:

Since the majority of WISE datasets and services will fall under the scope of INSPIRE, this guidance recommends the adoption of a profile which extends the INSPIRE metadata to include all those additional elements already agreed by the WISE community. This guidance recommends the use of INSPIRE terminology for element names wherever possible, thus ensuring compatibility with metadata created in other environmental policy areas.

The content and structure of the metadata file must be in conformance to the “Technical Guidance for the implementation of INSPIRE dataset and service metadata based on ISO/TS 19139:2007”².

² <https://inspire.ec.europa.eu/id/document/tg/metadata-iso19139>

INSPIRE metadata requirements for specific themes

The INSPIRE Data Specification on Area Management/Restriction/Regulation Zones and Reporting Units defines specific requirements and recommendations for the metadata **abstract**, **lineage** and **keywords**. See section 8 (Dataset-level metadata) of the technical guidelines for the full specification (<https://inspire.ec.europa.eu/id/document/tg/am>).

The requirements must be followed for the RiverBasinDistrict, SubUnit, SurfaceWaterBody, SurfaceWaterBodyLine, GroundWaterBody, ProtectedArea, ProtectedAreaLine, ProtectedAreaPoint data sets.

Note 1: Currently no such requirements exist for the MonitoringSite data set, under the INSPIRE Data Specification on Environmental Monitoring Facilities (<https://inspire.ec.europa.eu/id/document/tg/ef>). However Data Providers are recommended to adhere to the same requirements and recommendations applicable for the remaining datasets.

Table 10. INSPIRE Data Specification on Area Management requirement for specific metadata elements.

#	Metadata element	Reporting guidance
1.2	Resource abstract	<p>Recommendation 21</p> <p>To enable effective discovery of specific types of ManagementRestrictionOrRegulationZone data sets, providers should include the following information in the resource abstract:</p> <ul style="list-style-type: none"> - Type of zone or name of the spatial object that forms the reporting unit - Official full name of legislation that requires the establishment of the zone or reporting requirements
3.1	Keyword value	<p>IR Requirement</p> <p>Annex IV, Section 11.4.1</p> <p>Theme-specific Requirements – Management Restriction Or Regulation Zones</p> <p>(3) Data providers shall include the following keywords in addition to the mandatory keywords defined in Regulation (EC) 1205/2008:</p> <p>(a) One or several keywords describing the high-level classification of the zone type(s) included in the data set, as defined in ZoneTypeCode code list.</p> <p>(b) One or several keywords describing the official document number(s) of the legal instrument(s) under which the zone(s) included in the data set is (are) established. For Union legislation, the CELEX number shall be used.</p> <p>[...]</p> <p>EXAMPLE 1 For River Basin Districts, the following keywords shall/should be provided:</p> <ul style="list-style-type: none"> – River Basin District (zone type, required) – 32000L0060 (official document number (CELEX), required) – Water Framework Directive (legislation short name, recommended) – WFD (legislation acronym, recommended) – water (environmental domain, recommended)
6.1	Lineage	<p>IR Requirement</p> <p>Annex IV, Section 11.4.1</p> <p>Theme-specific Requirements – Management Restriction Or Regulation Zones</p> <p>(2) If the geometries of the spatial objects in a ManagementRestrictionOrRegulationZone data set are derived from the geometries of spatial objects in another data set, then this source data set (including its version) shall be described as part of the lineage metadata element.</p>

WISE reporting guidance for specific metadata elements

Table 11. WISE reporting guidance for specific metadata elements.

#	Metadata element	Reporting guidance
2.1	Topic category	Select at least option 012 (inlandWaters). This element is required.
3.1	Keyword value	Select the appropriate keywords from the WISE metadata keywords list (http://converters.eionet.europa.eu/xmlfile/WISE_metadata_keywords_1.xml) and identify the corresponding vocabulary. This element is required.
5.1	Temporal extent	Provide the period covered by the spatial data reported. The period should be defined by the planning period for which the real-world entities are expected to be valid. This element is required. See example below.
5.2	Date of publication	Provide the date of the reporting deadline of the period specified with Metadata element 5.1. This element is required. See example below.
5.3	Date of last revision	Provide the date of the last submitted update to the data set. This element is required. See example below.
8.1	Conditions for access and use	In accordance to the INSPIRE Technical Guidelines for the implementation of INSPIRE dataset and service metadata based on ISO/TS 19139:2007: <i>For detailed information about the licensing of the resource it is recommended to provide a link to a license type (e.g. http://creativecommons.org/licenses/by/3.0), a website or to a document containing the necessary information.</i> See also the WFD guidance about reporting the data set licence .
8.2	Limitations on public access	Limitations on public access , if any, must be clearly stated in the metadata. If no restrictions are stated, Category 3 will be applied (see the Data policy section, below) and a default no limitations to public access value will be assumed. Note that, for safety or security reasons, Data Providers may flag that the location of some monitoring sites (e.g. drinking water abstractions) must not be published. These restrictions are set at record-level and are always applied, regardless of the classification of the data set.
10.1	Metadata point of contact	Warning: The metadata point of contact information will be made publicly available when the European data sets are published. Use stable institutional emails and avoid providing information that might be construed as personal data.

Figure 15. Reporting dates in the metadata files (example).

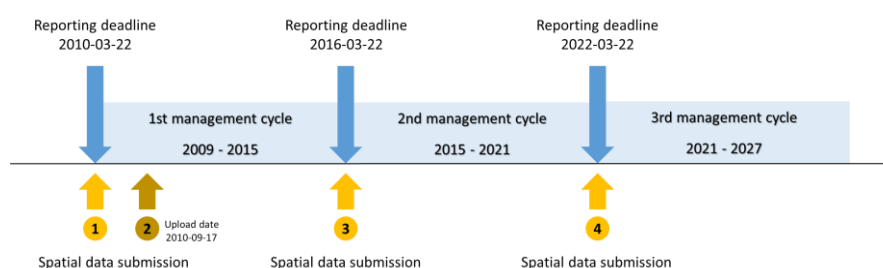


Table 12. Reporting dates in the metadata files (see also Figure 15).

Submission	Temporal extent	Date of publication	Date of last revision
1	From 2010-03-22 to 2016-03-22	2010-03-22	2010-03-22
2	From 2010-03-22 to 2016-03-22	2010-03-22	2010-09-17
3	From 2016-03-22 to 2022-03-22	2016-03-22	2016-03-22
4	From 2022-03-22 to 2028-03-22	2022-03-22	2022-03-22

Data exchange

Character encoding

The character encoding for all data and metadata files must be UTF-8.

File formats

The spatial data sets must be reported using **GML** files.

Data Providers may prepare the data using the *shapefile* format. *Shapefile* templates are available, and a *shapefile* to GML conversion tool is also provided directly in the envelope in CDR.

Some restrictions were adopted in the schemas to allow a similar description of the data sets regardless of the file format (GML or *shapefile*). For example, each type of geometry is reported in a separate data file (due to the limitations of the *shapefile* format).

See the CDR help page for further information (http://cdr.eionet.europa.eu/help/WFD/WFD_780_2022).

(For countries reporting only under WISE-5, see http://cdr.eionet.europa.eu/help/WISE_SoE/wise5.)

GML format

The schemas are available in the Data Dictionary (<http://dd.eionet.europa.eu/schemaset/WFD2022/view>).

Shapefile format

Shapefile templates are provided in the CDR help page. The templates must be used when preparing the data and using the conversion tools to from *shapefile* to GML.

Shapefiles must have the three structural files (*.shp, *.shx and *.dbf) and the *.prj and *.cpg files.

Shapefiles without the *.prj projection file (or with an incorrect definition of the coordinate system) will not be processed by the conversion tools. The *.cpg file is also mandatory as it explicitly identifies the character encoding used in the *.dbf file. Remember that the mandatory encoding is UTF-8.

Shapefiles with different fields in the attribute table will not be processed. This includes: additional fields, different field names or different field types. Note that the field names in a *shapefile* must have a maximum of 10 characters, so a "short" version of the GML names was defined for the *shapefile* templates (see the "Quick Reference Card" in page 2).

The DBF format used in the *shapefile* attribute table does not support NULL values (i.e. there is no difference between a NULL string and an empty string, or between a NULL value and a zero value). Also the structure of the table is fixed for all records (i.e. even if an optional attribute is not provided or is not applicable to a given record). To circumvent these limitations, Data Providers are requested to explicitly provide the conventional null values depending on the field type:

- Use **'NotApplicable'** for string fields;
- Use **-9999** for numeric fields;
- Use **9999-12-31** for date fields.

The DBF format has a maximum length of 254 characters for string fields. Be aware of this limitation.

File naming convention

The filenames of the spatial data sets should follow the following naming convention:

[DataSetType]_[CountryCode]_[Date]

Table 13. File naming convention.

Code	Description
[DataSetType]	<p>Identification of the content of the data set.</p> <ul style="list-style-type: none"> • RiverBasinDistrict • SubUnit • SurfaceWaterBody, for polygonal geometries • SurfaceWaterBodyLine, for linear geometries • GroundWaterBody • MonitoringSite • ProtectedArea, for polygonal geometries • ProtectedAreaLine, for linear geometries • ProtectedAreaPoint, for point geometries • SurfaceWaterBodyCentreline • GroundWaterBodyHorizon
[CountryCode]	<p>Use the two-letter ISO code of the country (ISO 3166 alpha-2), except for Greece and the United Kingdom, for which the abbreviations EL and UK must be used.</p> <p>Spatial data is reported in national data sets, to guarantee the geometric consistency of the spatial objects and avoid the rejection of data set due to inconsistencies between partial deliveries. Partial deliveries are not accepted.</p>
[Date]	Submission date in the format YYYYMMDD

Examples:

- RiverBasinDistrict_XZ_20220101
- SubUnit_XZ_20220101
- SurfaceWaterBody_XZ_20220101
- SurfaceWaterBodyLine_XZ_20220101
- GroundWaterBody_XZ_20220101
- MonitoringSite_XZ_20220101
- ProtectedArea_XZ_20220101
- ProtectedAreaLine_XZ_20220101
- ProtectedAreaPoint_XZ_20220101
- SurfaceWaterBodyCentreline_XZ_20220101
- GroundWaterBodyHorizon_XZ_20220101

The file extension depends on the file format.

- xml (for the metadata file)
- gml (for the spatial data file)

Data submission

Data must be uploaded in the Reportnet Central Data Repository (CDR).

For Data Providers reporting under WISE-5, collections have already been created in CDR for the reporting of spatial data:

- http://cdr.eionet.europa.eu/{country_code}/eu/wfd2022/spatial/

For Data Providers reporting under WISE-5, collections have already been created in CDR for the reporting of spatial data:

- http://cdr.eionet.europa.eu/{country_code}/eea/wise_soe/wise5/

Resubmissions and updates

If data is resubmitted or updated, then complete data sets have to be uploaded.

Incomplete spatial data sets will not pass the referential integrity quality control and thus cannot be further processed.

For the WFD2022 reporting (i.e. the 3rd RBMP reporting), the reference situation for any update or resubmission is the WFD2016 reporting (i.e. the 2nd RBMP reporting).

Contact wfd.helpdesk@eionet.europa.eu if you required assistance with an update or resubmission.

For the WISE-5 reporting, the reference situation for any update or resubmission is the last technically accepted envelope that has been processed into a European data set.

Contact wisesoe.helpdesk@eionet.europa.eu if you required assistance with an update or resubmission.

Data policy

Under the "WISE Reporting Arrangements", Member States have agreed on the conditions applicable to spatial data (see Annex 1 of the WISE Reporting Arrangements). For ease of reference, an extract of the current agreement (dated 2007-03-01) is transcribed below. The agreement may be subject to future changes.

Data storage

The European Commission (EC) and the European Environmental Agency (EEA) will store the geographic datasets on servers managed and accessible by the staff of the EC and the EEA. DG Environment will distribute parts or the entire datasets within the Commission, the EEA and to contractors, these last for the sole purpose of activities executed for the Commission and/or the EEA and limited to the duration of those activities.

Data usage

The Commission and the EEA are authorised to use the geographic data in the context of environmental policy definition, implementation, assessment and analysis:

- As geographic reference, i.e. creating a geographical context for other data;
- For the production of maps, publications, posters, presentations, web sites and any other electronic publication on the Internet. Electronic publication will be in the form of image maps;
- For spatial and statistical analysis;
- For deriving new geographic datasets by applying data manipulation procedures, e.g. combining different geographic datasets, generalisation procedures including smoothing and dropping of spatial features, adding new attribute information;
- For inclusion of the geographic data in other applications provided that it will not possible to extract the original geographic data.

Data distribution

The Commission and the EEA are authorized to distribute geographic data, if

- The source is acknowledged and,
- The data is not used for commercial purpose – unless approved by the provider - and,
- The data provider has not explicitly restricted their dissemination beyond what specified at point 2

[...]Distribution media of geographic data are paper publications, electronic publications, offline distribution on physical supports (e.g. CD-ROMs) and online distribution via the Internet services. Geographic data may be distributed as feature services on the Internet or vector data on physical support, only if data distribution conditions are met as specified in the metadata.

The metadata related to the geographic data and the derived geographic data will be distributed via a data catalogue service within the Commission, the EEA and to the public without any restrictions.

An acknowledgement of source including statement on legal constraints on access and use of geographic data, where appropriate, will be supplied with geographic data and derived products as part of the metadata information or as an accompanying document. [...]

Categories for distribution of geographic data and derived products as part [of the] metadata element on data constraints:

- Category 1: Internal use within Commission and EEA, publication as maps on paper or in electronic format as image maps.
- Category 2: Distribution of derived data and products under predefined conditions with the aim of decreasing the spatial accuracy or resolution of the geographic data.
- Category 3: Distribution of original data electronically as feature service or on physical support.

WISE spatial data set and INSPIRE themes

INSPIRE Area Management/Restriction/Regulation Zones and Reporting Units

Introduction

This section provides information about the relationship between the WISE spatial data sets and the INSPIRE AM theme (Annex III - Area Management/Restriction/Regulation Zones and Reporting Units).

It also provides information about the conceptual mapping between the elements in the WISE spatial data model and the elements in the INSPIRE AM data model.

Overview

The INSPIRE AM theme has a broad thematic scope: areas managed, regulated or used for reporting at international, European, national, regional and local levels, established in accordance with *specific legislative requirements* to deliver specific environmental objectives related to any environmental media (air, soil, water and biota).

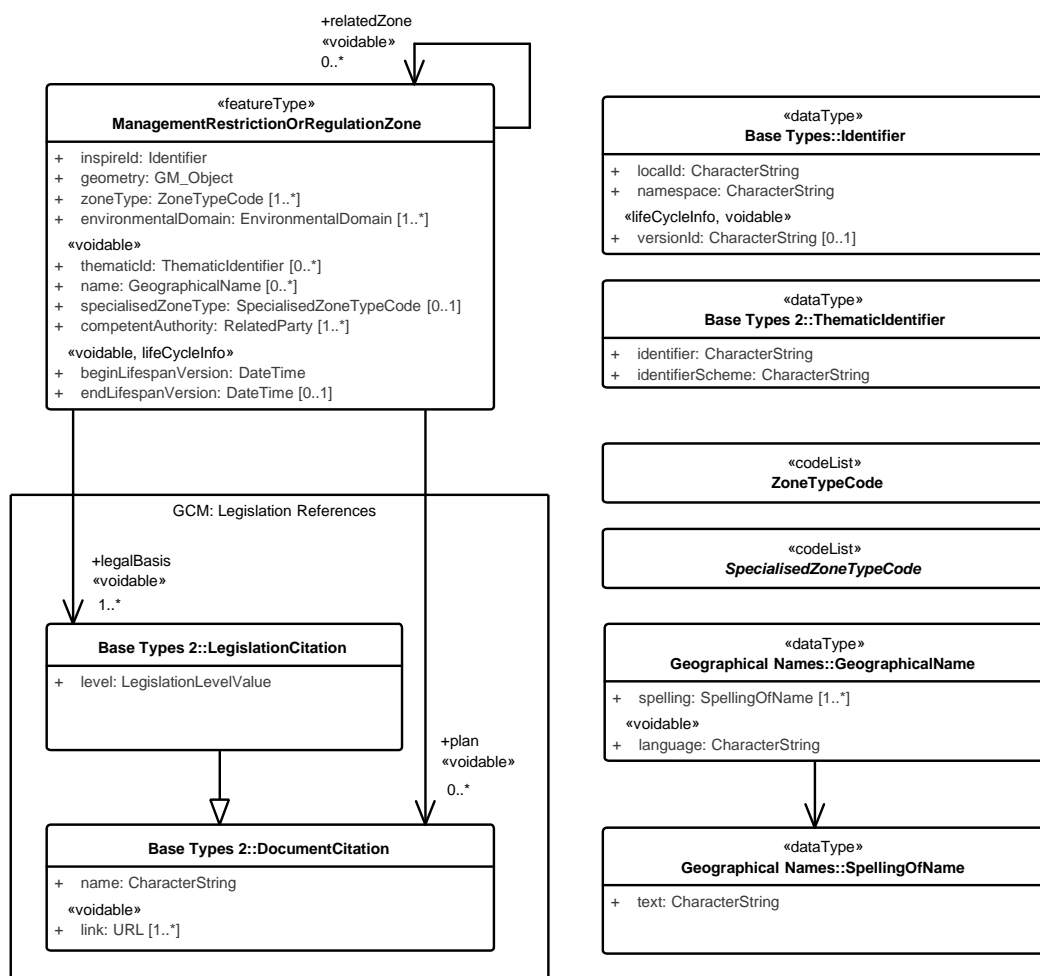
It explicitly excludes areas established to manage, regulate and restrict activities to conserve nature, biodiversity and cultural heritage (only), which are covered under the INSPIRE PS theme (Annex I - Protected Sites). However, areas with multiple environmental objectives that include nature and biodiversity conservation fall in the scope of the AM theme.

The following WISE spatial data sets are in the scope of the INSPIRE AM theme:

- River Basin Districts
- Sub-units
- Surface Water Bodies
- Groundwater Bodies
- Protected Areas

For informative purposes only, Figure 16 shows the part of the AM data model which is relevant for the WISE spatial data reporting.

Figure 16. Class diagram for the INSPIRE AM theme (informative only).



Required data elements

In the current WISE spatial data reporting, not all elements in the INSPIRE AM data model are requested:

- The **environmentalDomain** data element does not have to be reported, because it would have the fixed value 'Water' for all spatial data sets and objects.
- The **competentAuthority** data element does not have to be reported, because:
 - In the scope of the WFD reporting, the information on the River Basin District competent authorities is reported in the "non-spatial" XML files.
 - In the scope of the WFD reporting, this type of information is not requested for surface water bodies, groundwater bodies or protected areas.
 - In the scope of the WISE-5 reporting, information on competent authorities is not required.
- The **legalBasis** data elements are only mandatory for Protected Areas.

Important notes:

1. Data Providers implementing the INSPIRE Directive are still required include the above data elements in their INSPIRE visualisation and download services. The simplification adopted in WISE merely reflects the fact that not everything is strictly needed in the context of a specific reporting obligation (although it may be needed for other purposes).
2. Data Providers implementing the INSPIRE Directive are still required to use the INSPIRE schemas.

Voidable data elements

In the current WISE spatial data reporting, the INSPIRE «voidable» stereotype is not used:

- WISE data elements with multiplicity 1..1 are required and must be provided.
- WISE data elements with multiplicity 0..1 are treated as conditional: if the information exists or is applicable, it must be provided.

Requesting further information associated with «voidable» characteristics (such as the **VoidReasonValue**) was presently deemed unnecessary.

Multiplicity of the data elements

Some INSPIRE data elements and associations can have many instances (i.e. multiplicity 0..* or 1..*).

In the WISE spatial data sets, data elements typically have a maximum of one instance (i.e. multiplicity 0..1 or 1..1). This change was required by the "flat" structure in the current WISE spatial data files.

The restriction in multiplicity was applied to the **zoneType**, **thematicId**, **name**, **relatedZone** and **legalBasis** elements.

Reporting the geometry

The INSPIRE AM theme does not restrict the type of geometry of spatial objects.

However in the WISE spatial data sets, a decision was taken to keep the different types of geometry in separate data files. This allows the use of *shapefile* format (that does not support different types of geometry in the same file), if a Data Provider is not able to directly produce the GML files.

Also, in the current spatial data files, only 2D geometries are used (see Table 14).

Table 14. Geometry types for each WISE spatial data set.

Spatial data set	Geometry (GML)	Geometry (shapefile)	Notes
RiverBasinDistrict	GM_MultiSurface	Polygon	
SubUnit	GM_MultiSurface	Polygon	
SurfaceWaterBody	GM_MultiSurface	Polygon	
SurfaceWaterBodyLine	GM_MultiCurve	Polyline	(1)
GroundWaterBody	GM_MultiSurface	Polygon	
ProtectedArea	GM_MultiSurface	Polygon	
ProtectedAreaLine	GM_MultiCurve	Polyline	
ProtectedAreaPoint	GM_MultiPoint	Point	

(1) Only for river water bodies.

Reporting the **inspireId** and **thematicId**

The flattened structure of the current WISE spatial data files required the "flattening" of INSPIRE complex data elements or data types.

The INSPIRE **inspireId** data element has a complex data type: Identifier.

In the WISE spatial data sets, it must be provided using 3 separate data elements:

- **inspireIdLocalId;**
- **inspireIdNamespace;**
- **inspireIdVersionId.**

Figure 17. INSPIRE **Identifier** data type (informative only).

«dataType» Base Types::Identifier	
+ localId: CharacterString	
+ namespace: CharacterString	
«lifeCycleInfo, voidable»	
+ versionId: CharacterString [0..1]	

The INSPIRE **thematicId** data element also has a complex data type: **ThematicIdentifier**.

In the WISE spatial data sets, it must be provided using 2 separate data elements:

- **thematicIdIdentifier;**
- **thematicIdIdentifierScheme.**

Figure 18. INSPIRE **ThematicIdentifier** data type (informative only).

«dataType» Base Types 2::ThematicIdentifier	
+ identifier: CharacterString	
+ identifierScheme: CharacterString	

For reporting purposes, the thematic identifier is very important: it is required to join the spatial data with other thematic information. Please refer to the section on "Identifier management" for further information.

Life-cycle information

Life-cycle information at spatial object level is reported using the **beginLifespanVersion** and **endLifespanVersion** elements. Dates must be reported using the ISO 8601 extended format:

- YYYY-MM-DD, for days;
- YYYY-MM, for months;
- YYYY, for years.

(If necessary, or convenient, time values can be reported. The ISO 8601 extended format for UTC time should be used.)

Reporting predecessors and successors

The need to manage life-cycle information in the WISE spatial data sets is identified in CIS Guidance Document No. 22 (2009):

"Depending on the data, the reporting obligations and the intended use of the data, it will be necessary to establish a system that manages temporal changes of non-hydrological features including the identification of predecessors and successors.

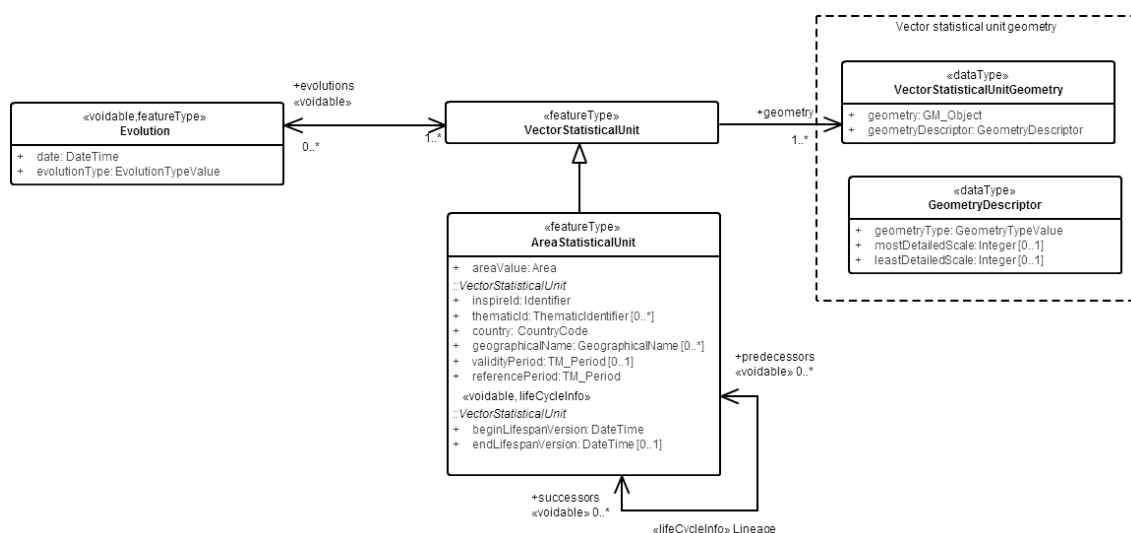
Changes will occur from one reporting period to another (submission of datasets according to reporting deadlines) but also in between reporting periods (update/resubmission of datasets)."

The concept of predecessors and successors does not exist in the INSPIRE AM theme.

However, the INSPIRE SU theme (Annex III - Statistical Units) data specification extensively discusses the issue of changes in statistical units (see Annex F), and provides the necessary concepts and data elements.

For information purposes only, part of the INSPIRE SU theme data model is represented Figure 19.

Figure 19. Class diagram INSPIRE SU theme (informative only).



In the INSPIRE SU theme, changes are represented through the elements **validityPeriod**, **beginLifeSpanVersion** and **endLifeSpanVersion**. The **validityPeriod** in the SU theme can be considered functionally equivalent to the **designationPeriod** in the AM theme.

Additional information about the lineage is represented using two associations:

- **predecessors** which identifies the object(s) that the current object replaces;
- **successors** which identifies the object(s) that replace the current object.

Finally, the INSPIRE **evolutions** association is used to clarify the type of event (aggregation, splitting, etc.) that generated the current object.

In the WISE spatial data sets, these concepts are adopted.

Predecessors are identified through their thematic identifiers, using two elements:

- **predecessorsIdentifier** which must contain a comma-separated list of the identifiers of the object(s) that have been deactivated/replaced by the presently reported object;
- **predecessorsIdentifierScheme** which must contain the identifiers' scheme.

These elements are conditional: predecessors must be reported if the current object is replacing something. For example, if surface water body 'ZZ1234' is the aggregation of surface water body 'ZZ12' and surface water body 'ZZ34' previously reported, then 'ZZ12' and 'ZZ34' must be reported as predecessors of 'ZZ1234'.

Successors are also identified through their thematic identifiers, using two elements:

- **successorsIdentifier** which must contain a comma-separated list of the identifiers of the object(s) that have replaced the presently reported object;
- **successorsIdentifierScheme** which must contain the identifiers' scheme.

Again, these elements are conditional: successors must be reported if they exist.

The **wiseEvolutionType** element explicitly states what type of event generated the object. This element is mandatory (even if there are no predecessors or successors to be reported).

The following allowable values have the same meaning defined in the INSPIRE SU theme: 'creation', 'deletion', 'aggregation', 'splitting' and 'change'.

For the purposes of the WISE reporting, other change types required in the WFD reporting were added: 'changeCode', 'changeBothAggregationAndSplitting', 'changeExtendedArea', 'changeExtendedDepth', 'changeExtendedAreaAndDepth', 'changeReducedArea', 'changeReducedDepth', 'changeReducedAreaAndDepth', 'noChange'.

The 'noChange' option must not be used if predecessors or successors are reported for a given spatial object. A typical example for the use of the 'noChange' option is the reporting of a water body that had no changes in the geometry and in the identifier since the 2nd RBMP reporting cycle.

The 'deletion' option must be used if an object that is no longer designated must be reported. A typical example for the use of the 'deletion' option is the reporting of a water body that was valid in the 2nd RBMP reporting cycle but that is no longer valid in the 3rd RBMP reporting cycle.

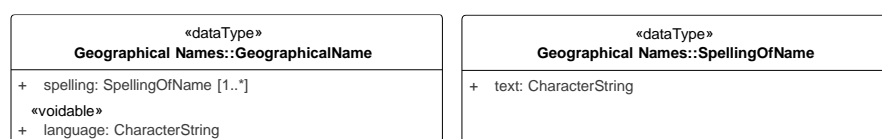
Reporting geographical names

Data Providers are requested to report the geographical name of each object in a national language and to identify the national language used. Optionally, an English language version of the name is also requested, if available.

In any INSPIRE theme, geographical names should be represented using the generic mechanism proposed under the Geographical Names data specification (see INSPIRE Annex I Geographical Names data specifications), which uses the complex data type **GeographicalName**.

Only the data elements represented in Figure 20 were deemed strictly necessary:

Figure 20. INSPIRE **GeographicalName** data type (informative only).



In the WISE spatial data sets, the following data elements are used:

- **nameText**, with the name in a national language (equivalent to the **text** data element in the INSPIRE **SpellingOfName** data type);
- **nameLanguage**, with the ISO 639-2/B code of the national language (equivalent to the **language** data element of the INSPIRE **GeographicalName** data type);
- **nameTextInternational**, an mandatory element with an English exonym or an understandable English version of the **name** of the geographical feature or spatial object (in this case, the **language** element is not requested).

Very important note: the **nameTextInternational** value can only contain letters of the basic Latin character set (A-Z), digits (0-9) spaces or hyfens. Diacritics, special characters, accents, etc., are not allowed.

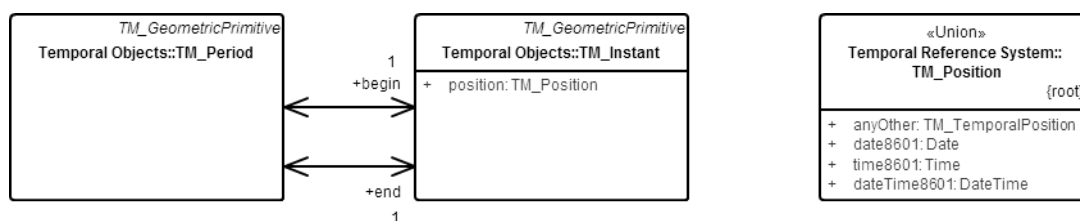
Note that the same mechanism is used for all WISE spatial data sets (e.g. river basin districts, water bodies, etc.).

Reporting the designationPeriod

The INSPIRE **designationPeriod** data element has a **TM_Period** data type.

The **TM_Period** data type has a relatively complex structure.

Figure 21. **TM_Period** data type (informative only).



In the current WISE spatial data reporting, this structure was simplified and includes only two data elements:

- **designationPeriodBegin** with the start date of the designation period;
- **designationPeriodEnd** with the end date.

The **designationPeriodEnd** data element is optional (i.e. has multiplicity 0..1): it does not need to be provided if the end of the time period is indeterminate or currently unknown.

The dates must be reported in the ISO 8601 extended format:

- YYYY-MM-DD, for days;
- YYYY-MM, for months;
- YYYY, for years.

Reporting the **zoneType** and the **specialisedZoneType**

The INSPIRE **zoneType** and **specialisedZoneType** data elements allow users to locate and filter information about different types of AM zones.

In the current WISE spatial data reporting, each type of AM zone is reported in a separate data file.

In theory, the zone type could be inferred from the file name or from its associated schema. However, for quality control purposes, it is important to keep the **zoneType** and **specialisedZoneType** elements in the data model, even if all objects in a given data file have the same value (e.g. all river basin districts have the same zone type). Table 15 details the valid code list values for each type of spatial object.

Important note: It is not necessary to report the spatial data for areas protected under the Habitats Directive or the Birds Directive, since that information is reported via the Natura2000 data flow. Also note that those protected areas are in the scope of the INSPIRE Protected Sites (PS) theme, and not in the scope of the INSPIRE AM theme.

Table 15. Valid **zoneType** and **specialisedZoneType** values for each WISE spatial data set.

Object type	zoneType value	specialisedZoneType value	Notes
RiverBasinDistrict	riverBasinDistrict	-- not applicable --	
SubUnit	riverBasinDistrict	riverBasinDistrictSubUnit	
SurfaceWaterBody	waterBody	riverWaterBody lakeWaterBody transitionalWaterBody coastalWaterBody	
		territorialWaters	
GroundWaterBody	waterBody	groundwaterBody	
ProtectedArea	drinkingWaterProtectionArea	-- not applicable --	
	designatedWaters	shellfishDesignatedWater freshwaterFishDesignatedWater otherProtectedArea	
	bathingWaters	riverBathingWater lakeBathingWater transitionalBathingWater coastalBathingWater	(1)
	sensitiveArea	riverSensitiveArea lakeSensitiveArea transitionalSensitiveArea coastalSensitiveArea lessSensitiveArea catchmentOfSensitiveArea	(2)
	nitrateVulnerableZone	-- not applicable --	(3)

(1) These protected areas are reported under the Bathing Water Directive data flow.

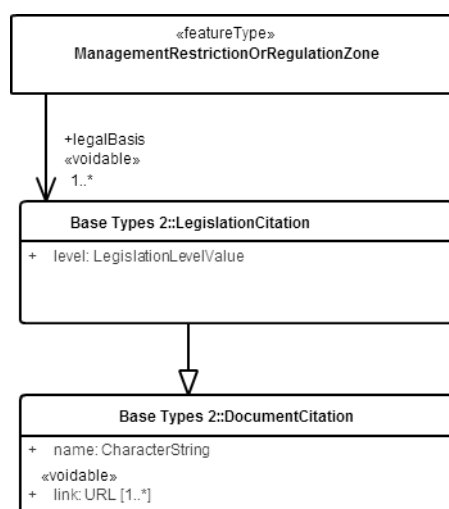
(2) These protected areas are reported under the Urban Waste Water Treatment Directive data flow.

(3) These protected areas are reported under the Nitrates Directive data flow.

Reporting the legalBasis information

In the current WISE spatial data reporting, the INSPIRE **legalBasis** information is only mandatory for Protected Areas. Figure 22 illustrates the relevant data elements in the INSPIRE AM data model.

Figure 22. INSPIRE *LegislationCitation* (informative only).



In the current WISE spatial data reporting, the following 3 data elements are used:

- **legalBasisName** with the official name of the legislative instrument;
- **legalBasisLink** with a link to an online version of the document;
- **legalBasisLevel** with the level at which the legislative instrument is adopted (allowable values are 'european', 'international', 'national', or 'sub-national').

Table 16. *legalBasisName* and *legalBasisLink* for European level legislation.

	legalBasisName value	LegalBasisLink value
UWWTD	Council Directive 91/271/EEC of 21 May 1991 concerning urban waste-water treatment	http://data.europa.eu/eli/dir/1991/271/oj
Nitrates	Council Directive 91/676/EEC of 12 December 1991 concerning the protection of waters against pollution caused by nitrates from agricultural sources	http://data.europa.eu/eli/dir/1991/676/oj
DWD	Council Directive 98/83/EC of 3 November 1998 on the quality of water intended for human consumption	http://data.europa.eu/eli/dir/1998/83/oj
WFD	Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy	http://data.europa.eu/eli/dir/2000/60/oj
BWD	Directive 2006/7/EC of the European Parliament and of the Council of 15 February 2006 concerning the management of bathing water quality and repealing Directive 76/160/EEC	http://data.europa.eu/eli/dir/2006/7/oj
Fish	Directive 2006/44/EC of the European Parliament and of the Council of 6 September 2006 on the quality of fresh waters needing protection or improvement in order to support fish life	http://data.europa.eu/eli/dir/2006/44/oj
Shellfish	Directive 2006/113/EC of the European Parliament and of the Council of 12 December 2006 on the quality required of shellfish waters	http://data.europa.eu/eli/dir/2006/113/oj

Reporting **relatedZone** information

In the INSPIRE AM model, the **relatedZone** association allows one **ManagementRestrictionOrRegulationZone** object to be "linked" to zero or more **ManagementRestrictionOrRegulationZone** objects. In the current WISE spatial data reporting, the **relatedZone** association has a more restricted meaning (see Figure 29 in page 55):

- Each SubUnit must be related to one and only one RiverBasinDistrict;
- Each SurfaceWaterBody must be related to one and only one SubUnit;
- Each GroundWaterBody must be related to one and only one RiverBasinDistrict;
- Each ProtectedArea may be related to one and one water body. If more than one waterbody is related to the ProtectedArea, do not report this information.

Each related zone is identified using its thematic identifier, which requires the following 2 data elements:

- **relatedZoneIdentifier** and
- **relatedZoneIdentifierScheme**.

For transboundary water bodies, the identifier of a neighbouring water body may be reported using:

- **relatedZoneTransboundaryIdentifier** and
- **relatedZoneTransboundaryIdentifierScheme**.

Note 1: The transboundary identifier should be a valid WFD or EIONET identifier in the [SurfaceWaterBody](#) vocabulary or in the [GroundWaterBody](#) vocabulary.

For an international RiverBasinDistrict (or an international SubUnit), the identifier of a neighbouring RiverBasinDistrict (respectively, an international SubUnit) may be reported using the **relatedZoneTransboundaryIdentifier** and **relatedZoneTransboundaryIdentifierScheme**.

Note 2: The transboundary identifier should be an appropriate valid WFD or EIONET identifier in the [SpatialUnit](#) vocabulary.

Data elements specific to WISE

The following additional WISE data elements are not related to INSPIRE elements: **sizeValue**, **sizeUom**, **meanDepth**, **horizons** and **link**.

INSPIRE Environmental Monitoring Facilities

Introduction

This section provides information about the relationship between the WISE spatial data sets and the INSPIRE EF theme (Annex III - Environmental Monitoring Facilities).

This section provides information about the conceptual mapping between the data elements in the WISE spatial data model and the data elements in the INSPIRE EF data model.

Overview

The INSPIRE EF theme covers the “*location and operation of environmental monitoring facilities includes observation and measurement of emissions, of the state of environmental media and of other ecosystem parameters (biodiversity, ecological conditions of vegetation, etc.) by or on behalf of public authorities*”. The EF theme allows the representation of Environmental Monitoring Facilities, Networks, Activities and Programmes.

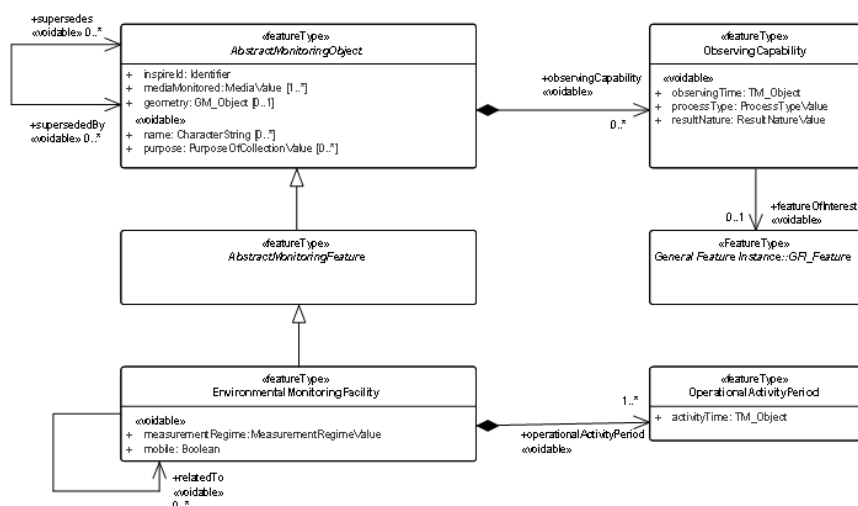
In the current WISE spatial data reporting, only the aspects related to Environmental Monitoring Facilities (e.g. monitoring sites) are covered in the spatial data sets.

The following WISE spatial data sets are related to the INSPIRE EF theme:

- Monitoring Sites

For informative purposes only, the following diagram shows the part of the EF data model which is relevant for the WISE spatial data reporting.

Figure 23. Class diagram for the INSPIRE EF theme (informative only).



Required data elements

In the current WISE spatial data reporting, not all elements in the INSPIRE EF data model are requested:

- The **measurementRegime** or **mobile** nature of the environmental monitoring facility is not requested;
- Only information about the **featureOfInterest** is requested with regard to the **observingCapability**;
- Only a "global" **operationalActivityPeriod** is requested.

Important notes:

1. Data Providers implementing the INSPIRE Directive are still required include the above data elements in their INSPIRE visualisation and download services. The simplification adopted in WISE merely reflects the fact that not everything is strictly needed in the context of a specific reporting obligation (although it may be needed for other purposes).
2. Data Providers implementing the INSPIRE Directive are still required to use the INSPIRE schemas.

Voidable data elements

In the current WISE spatial data reporting, the INSPIRE «voidable» stereotype is not used:

- WISE data elements with multiplicity 1..1 are required and must be provided.
- WISE data elements with multiplicity 0..1 are treated as conditional: if the information exists or is applicable, it must be provided.

Requesting further information associated with «voidable» characteristics (such as the **VoidReasonValue**) was presently deemed unnecessary.

Multiplicity of the data elements

Some INSPIRE data elements and associations can have many instances (i.e. multiplicity 0..* or 1..*).

In the WISE spatial data sets, data elements typically have a maximum of one instance (i.e. multiplicity 0..1 or 1..1). This change was required by the "flat" structure in the current WISE spatial data files.

The restriction in multiplicity was applied to the following INSPIRE elements: **name**, **mediaMonitored**, **purpose**, **relatedTo** and **operationalActivityPeriod**.

Reporting the geometry

The INSPIRE EF theme does not restrict the type of geometry of spatial objects.

However in the WISE MonitoringSite data set, 2D points must be used. If the reference geometry is a path (i.e. for mobile stations) or an area, then a representative point must be provided.

Table 17. Allowed geometry types for the MonitoringSite spatial data set.

Spatial data set	Geometry (GML)	Geometry (shapefile)
MonitoringSite	GM_Point	Point

Reporting the **inspireId** and **thematicId**

The flattened structure of the current WISE spatial data files required the "flattening" of INSPIRE complex data elements or data types.

The INSPIRE **inspireId** data element has a complex data type: Identifier.

In the WISE spatial data sets, it must be provided using 3 separate data elements:

- **inspireIdLocalId**;
- **inspireIdNamespace** and
- **inspireIdVersionId**.

Figure 24. INSPIRE **Identifier** data type (informative only).

«dataType» Base Types::Identifier	
+	localId: CharacterString
+	namespace: CharacterString
«lifeCycleInfo, voidable»	
+	versionId: CharacterString [0..1]

Unlike other INSPIRE Annex III themes, the EF data specification does not foresee the need for thematic identifiers. However, monitoring sites can be known by different codes, depending on the context of their use in reporting obligations. For this reason, a thematic identifier is also needed and used in the WISE MonitoringSite data set.

Examples are provided in the section on "Identifier management".

The INSPIRE **thematicId** data element also has a complex data type: **ThematicIdentifier**.

In the WISE spatial data sets, it must be provided using 2 separate data elements:

- **thematicIdIdentifier**, and
- **thematicIdIdentifierScheme**.

Figure 25. INSPIRE **ThematicIdentifier** data type (informative only).

«dataType» Base Types 2::ThematicIdentifier	
+	identifier: CharacterString
+	identifierScheme: CharacterString

For reporting purposes, the thematic identifier is very important: it is required to join the spatial data with other thematic information. Please refer to the section on "Identifier management" for further information.

Life-cycle information

Life-cycle information at spatial object level is reported using the **beginLifespanVersion** and **endLifespanVersion** elements. Dates must be reported using the ISO 8601 extended format:

- YYYY-MM-DD, for days;
- YYYY-MM, for months;
- YYYY, for years.

(If necessary, or convenient, time values can be reported. The ISO 8601 extended format for UTC time should be used.)

Reporting predecessors and successors

The need to manage life-cycle information in the WISE spatial data sets is identified in Guidance Document No. 22 (2009):

"Depending on the data, the reporting obligations and the intended use of the data, it will be necessary to establish a system that manages temporal changes of non-hydrological features including the identification of predecessors and successors.

Changes will occur from one reporting period to another (submission of datasets according to reporting deadlines) but also in between reporting periods (update/resubmission of datasets)."

In the INSPIRE EF theme, the concept of predecessors and successors is encoded using the associations **supersedes** and **supersededBy**, respectively. (Please refer to the section on "Reporting predecessors and successors" for Areas of Management for further information).

Predecessors are identified through their thematic identifiers, using two elements:

- **supersedesIdentifier** which must contain a comma-separated list of the identifiers of the object(s) that have been deactivated/replaced by the presently reported object;
- **supersedesIdentifierScheme** which must contain the identifiers' scheme.

These elements are conditional: predecessors must be reported if the current object is replacing something.

Successors are also identified through their thematic identifiers, using two elements:

- **supersededByIdentifier** which must contain a comma-separated list of the identifier of the object(s) that have replaced the presently reported object;
- **supersededByIdentifierScheme** which must contain the identifiers' scheme.

Again, these elements are conditional: successors must be reported if they exist.

The **wiseEvolutionType** element explicitly states what type of event generated the object. This element is mandatory (even if there are no predecessors or successors to be reported).

Reporting geographical names

Data Providers are requested to report the geographical name of each object in a national language and to identify the national language used. Optionally, an English language version of the name is also requested, if available.

In any INSPIRE theme, geographical names should be represented using the generic mechanism proposed under the Geographical Names data specification (see INSPIRE Annex I Geographical Names data specifications), which uses the complex data type **GeographicalName**.

Only the data elements represented in Figure 20 were deemed strictly necessary:

Figure 26. INSPIRE **GeographicalName** data type (informative only).



In the WISE spatial data sets, the following data elements are used:

- **nameText**, with the name in a national language (equivalent to the **text** data element in the INSPIRE **SpellingOfName** data type);
- **nameLanguage**, with the ISO 639-2/B code of the national language (equivalent to the **language** data element of the INSPIRE **GeographicalName** data type);
- **nameTextInternational**, an optional element with an English exonym or an understandable English version of the **name** of the geographical feature or spatial object (in this case, the **language** element is not requested).

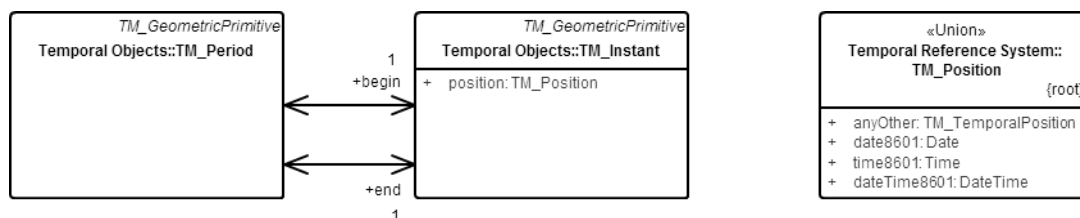
Very important note: the **nameTextInternational** value can only contain letters of the basic Latin character set (A-Z), digits (0-9) spaces or hyfens. Diacritics, special characters, accents, etc., are not allowed.

Reporting the operationalActivityPeriod

The INSPIRE **operationalActivityPeriod** data element has a **TM_Period** data type.

The **TM_Period** data type has a relatively complex structure.

Figure 27. **TM_Period** data type (informative only).



In the current WISE spatial data reporting, this structure was simplified and includes only two data elements:

- **operationalActivityPeriodBegin** with the start date;
- **operationalActivityPeriodEnd** with the end date.

The **operationalActivityPeriodEnd** data element is optional (i.e. has multiplicity 0..1): it does not need to be provided if the end of the time period is indeterminate or currently unknown (meaning that the monitoring site is still operational).

The dates must be reported in the ISO 8601 extended format:

- YYYY-MM-DD, for days;
- YYYY-MM, for months;
- YYYY, for years.

Note that only one "global" operational period is requested. While this simplification does not allow the reporting of inactivity periods (which would be possible under the INSPIRE structure), a decision was taken to

keep the structure as simple as possible - and similar to the one used to the **designationPeriod** applicable to areas of management.

Reporting the **featureOfInterest**

Each monitoring site is providing observation data for a given water body: its **featureOfInterest**.

In the INSPIRE EM theme, monitoring facilities have zero or more **observingCapability** over a given domain or **featureOfInterest**. As explained above, in the current WISE spatial data reporting, the **featureOfInterest** association has a very restricted meaning: it allows the identification of the water body being monitored.

In the WISE spatial data sets, the **featureOfInterest** association is implemented using the thematic identifier, which requires the following 2 data elements:

- **featureOfInterestIdentifier** and
- **featureOfInterestIdentifierScheme**.

Please refer to the section on "Identifier management" for further information.

Reporting the **relatedTo** information

In the INSPIRE EF model, the **relatedTo** association allows one **EnvironmentMonitoringFacility** object to be "linked" to any other type of spatial object.

In the WISE spatial data sets, the **relatedTo** association is implemented using the thematic identifier, which requires the following 2 data elements:

- **relatedToIdentifier** and
- **relatedToIdentifierScheme**.

In the current WISE spatial data reporting, the **relatedTo** association has a very restricted meaning: it is required only if a WFD monitoring site was also an EIONET monitoring site formerly reported under the EEA WISE SoE dataflows.

If this happens, then the EIONET monitoring site identifier must be provided in **relatedToIdentifier** element, while the **relatedToIdentifierScheme** takes the value 'eionetMonitoringSiteCode'.

Please refer to the section on "Identifier management" for further information.

Reporting the **mediaMonitored** information

In the WISE spatial data sets, the **mediaMonitored** is reported using 3 Boolean elements:

- **mediaMonitoredBiota**;
- **mediaMonitoredWater**;
- **mediaMonitoredSediment**.

In the scope of the WFD reporting, the relevant information is that related to the WFD monitoring programmes (see the relevant elements under the Monitoring schema for the non-spatial data).

Clarification: if biological quality elements are being monitored set **mediaMonitoredBiota** = true.

Reporting the monitoring purpose information

In the WISE spatial data sets, the **purpose** data element must be reported using a comma-separated list of monitoring purposes, based on the set of allowable values defined for the WFD and WISE-5 reporting.

Table 18 presents the valid 3-letter codes for the different monitoring purposes.

The analysis of information reported in the 2nd RBMP revealed inconsistencies and duplications in the reporting. A simplification of the code list is proposed from the 3rd RBMP reporting, keeping only the purposes that cannot be derived from other data sources. A new code 'WFD' code is proposed, to identify monitoring sites included in WFD monitoring programmes – which must be reported in the Monitoring schema of the descriptive data reporting.

Table 18. Monitoring purpose of monitoring sites (*PurposeOfCollection* code list).

Code	Label
WFD	WFD Monitoring Site
	Protected area
DWD	Drinking water - WFD Annex IV.1.i
SHE	Shellfish designated waters - WFD Annex IV.1.ii
BWD	Recreational or bathing water - WFD Annex IV.1.iii
UWW	Nutrient sensitive area under the Urban Waste Water Treatment Directive - WFD Annex IV.1.iv
NID	Nutrient sensitive area under the Nitrates Directive - WFD Annex IV.1.iv
HAB	Protection of habitats or species depending on water - WFD Annex IV.1.v
	Transboundary monitoring
RIV	International network of a river convention (including bilateral agreements)
SEA	International network of a sea convention
INT	International network of other international convention
SOE	EIONET State of Environment monitoring
AGR	Groundwater abstraction site for irrigation
IND	Groundwater abstraction site for industrial supply
DRI	Groundwater abstraction site for human consumption
	Other monitoring purpose or network
MSF	Marine Strategy Framework Directive monitoring network
REF	Reference network monitoring site

Data elements specific to WISE

The following additional WISE data elements are not related to INSPIRE elements: **catchmentArea**, **maximumDepth**, **confidentialityStatus** and **link**.

Identifier management

Overview

The requirements for life-cycle information in the WISE spatial data sets are stated in the following excerpt of the CIS Guidance Document No 22 (section 4.4.4):

The management of the identifiers and codes at European level will include:

- *The publication of the identifiers/codes in WISE and the description of their development;*
- *The registration of the namespace used (including entity type codes if used);*
- *The description of life-cycle rules of the spatial objects of the WISE Reference GIS datasets;*
- *An explanation if identifiers/codes have been changed or new identifiers/codes have been created (e.g. change of RBDs or Sub-units) during an update. [...]*
- *The description how Member States should use the identifiers/code, including how the referencing of objects provided by Member States to the objects of the WISE Reference GIS datasets will be performed.*

This section provides an overview on issues related to identifier management for the spatial objects in the different WISE spatial data sets, namely:

- The use of thematic identifiers to uniquely identify spatial objects in WISE;
- The possible relationship between thematic identifiers and INSPIRE identifiers (for countries implementing the INSPIRE Directive).

It also provides practical information and examples on:

- How to use the thematic identifiers to report the WFD and EIONET identifier of an object that was reported under different data flows;
- How to use the thematic identifiers to relate a monitoring site to a water body, a water body to a sub-unit or a river basin district, etc.

Please refer to the section on “Life-cycle management” for additional information on:

- How to report changes in the water bodies (e.g. from the 2016 WFD delineation to the 2022 WFD delineation) and other spatial objects;
- How to report changes in monitoring sites (e.g. changes in the identifiers, or changes in the monitoring site itself that do not ‘break’ the existing time series).

Using thematic identifiers

What is a thematic identifier?

Thematic identifiers are identifiers of real-world phenomena. The concept was introduced in the INSPIRE Annex II/III data models, recognising that a given spatial object may be known under different "codes" depending on the thematic context or the reporting obligation:

"Multiple thematic object identifiers may be assigned to a zone where different data exchange requirements (e.g. national vs European reporting) have defined different lexical rules for thematic object identifiers. Where multiple thematic object identifiers exist all should be provided. This shall allow external datasets that use these thematic object identifiers for referencing to link to the INSPIRE spatial object."

To fulfil this requirement, the INSPIRE Annex II/III data models introduced a new base type named **ThematicIdentifier**, which is composed of two elements: **identifier** and **identifierScheme**.

Figure 28. INSPIRE **ThematicIdentifier** data type (informative only).

«dataType» Base Types 2::ThematicIdentifier	
+	identifier: CharacterString
+	identifierScheme: CharacterString

Identifiers must be unique within each identifier scheme.

Most INSPIRE Annex II/III data models include a **thematicID** element, with multiplicity 0..*, and **ThematicIdentifier** data type.

Furthermore, according to the INSPIRE Generic Conceptual Model (D2.5_v3.4rc3):

INSPIRE data models should aim at not duplicating information that is already covered by existing reporting data flows in order not to create an additional burden on Member States. Since reporting obligations and the maturity of data flows and reporting sheets differ in the different INSPIRE themes, the following specific principles should be applied:

- *Where there are existing and well-established data flows for reporting data from Member States to the Commission / EEA, INSPIRE data models should be limited to providing spatial objects and attributes that allow "joining" the reporting data to the spatial objects (e.g. external object identifiers or thematic identifiers).*

In the WISE spatial data models, thematic identifiers are adopted to "join" the non-spatial data (in the different reporting obligations) to the spatial objects.

Given that complex XML data types are avoided in the current WISE spatial data models, two elements are always used to encode the thematic identifier:

- **thematicIDIdentifier** and
- **thematicIDIdentifierScheme**.

Using thematic identifiers to identify monitoring sites, water bodies, etc.

Thematic identifiers are used for monitoring sites, water bodies, river basin districts and sub-units, and protected areas.

The identifier scheme (i.e. the scope within which an identifier is valid) varies according to the object type and according to the data flow that establishes the reporting obligation. The thematic identifiers are unique within a given identifier scheme.

The full list of the WISE thematic identifiers can be accessed in the WISE vocabularies (Table 19).

Some objects may have identifiers in two different lists: only one should be valid. For example, some WFD monitoring sites were initially reported as EIONET monitoring sites: their EIONET identifier should be superseded by the WFD identifier.

The WISE identifiers must³:

- Start with the ISO 3166-1 alpha-2 country code, **except for Greece ('EL') and the United Kingdom ('UK')**;
- Be followed by the national code, with a maximum of **40 characters**;
- Use only **upper case letters** [A to Z] and **digits** [0 to 9].
The **underscore** character ('_') or the **hyphen** character ('-') may be used as separators within the code (but not to separate the country code from the national code, and not in the end of the code).

Note: If the national identifiers have a syntax that is not compatible with the requirements of the WISE thematic identifiers, they can still be reported in the INSPIRE **localId** element. That should allow Data Providers to keep a clear mapping between the national identifiers and the European identifiers.

Table 19. WISE vocabularies and identifier schemes for the different spatial object types.

WISE vocabulary	Spatial Object	WFD Identifier Scheme	WISE-5 Identifier Scheme
MonitoringSite	MonitoringSite	'euMonitoringSiteCode'	'eionetMonitoringSiteCode'
WaterBody	SurfaceWaterBody	'euSurfaceWaterBodyCode'	'eionetSurfaceWaterBodyCode'
	GroundWaterBody	'euGroundWaterBodyCode'	'eionetGroundWaterBodyCode'
SpatialUnit	SubUnit	'euSubUnitCode'	'eionetSubUnitCode'
	RiverBasinDistrict	'euRBDCode'	'eionetRBDCode'
WFDProtectedArea	ProtectedArea	'euProtectedAreaCode'	

³ The syntax of the WISE identifiers can be checked using the following REGEX expression (see for example <https://regex101.com/>):
`^[A-Z]{2}[0-9A-Z]{1}(:[0-9A-Z](?!(:[-_]{2}|\-)))[-_]?{0,38}([0-9A-Z]{1}){0,1}$$`

Using thematic identifiers to relate two objects with different types

In WISE, the thematic identifiers are also used to link objects of different types. Figure 29 and provide an overview of the existing associations.

Figure 29. Overview of the relationships between different WISE spatial object types.

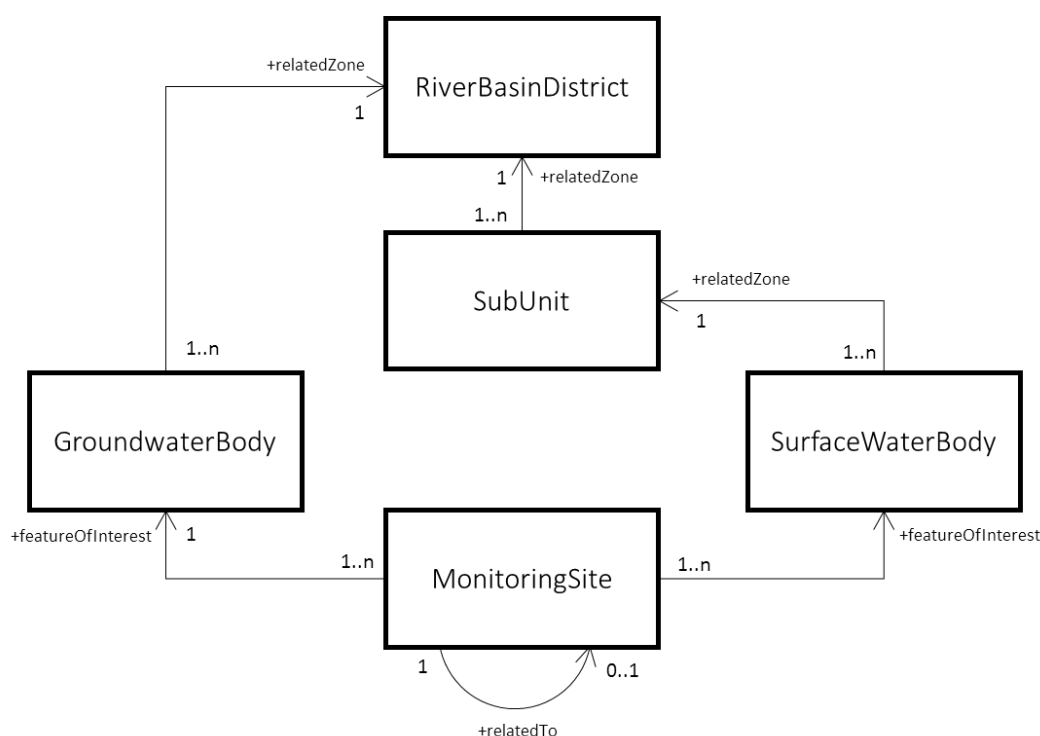


Table 20. Description of the relationships between different WISE spatial object types.

Source Spatial Object Type	Association	Definition	Target Spatial Object Type
MonitoringSite	featureOfInterest	Identifies the water body being monitored.	SurfaceWaterBody GroundWaterBody
SurfaceWaterBody	relatedZone	Identifies the sub-unit that the surface water body belongs to.	SubUnit
GroundWaterBody	relatedZone	Identifies the river basin district that the groundwater body belongs to.	RiverBasinDistrict
SubUnit	relatedZone	Identifies the river basin district that the sub-unit belongs to.	RiverBasinDistrict

All these associations are implemented using thematic identifiers, which always requires the pair identifier and identifier scheme (for example, **relatedZoneIdentifier** and **relatedZoneIdentifierScheme** encode the association **relatedZone**).

Note: for transboundary water bodies, an additional association between the water body and another water body in a neighbouring country can be reported using the **relatedZoneTransboundaryIdentifier** and **relatedZoneTransboundaryIdentifierScheme** elements.

The identifier scheme used for the source spatial object must be consistent with identifier scheme used for the target object. Table 21 lists the valid combinations in the WISE spatial data sets.

Table 21. Using consistent identifier schemes to relate different WISE objects.

Source object		Target object		Validity constraints
Object Type	Identifier Scheme	Object Type	Identifier Scheme	
MonitoringSite	'euMonitoringSiteCode'	SurfaceWaterBody	'euSurfaceWaterBodyCode'	2)
"	"	GroundWaterBody	'euGroundWaterBodyCode'	2)
"	'eionetMonitoringSiteCode'	SurfaceWaterBody	'eionetSurfaceWaterBodyCode'	1)
"	"	GroundWaterBody	'eionetGroundWaterBodyCode'	1)
SurfaceWaterBody	'euSurfaceWaterBodyCode'	SubUnit	'euSubUnitCode'	2)
"	'eionetSurfaceWaterBodyCode'	SubUnit	'eionetSubUnitCode'	1)
GroundWaterBody	'euGroundWaterBodyCode'	RiverBasinDistrict	'euRBDCode'	2)
"	'eionetGroundWaterBodyCode'	RiverBasinDistrict	'eionetRBDCode'	1)
SubUnit	'euSubUnitCode'	RiverBasinDistrict	'euRBDCode'	2)
"	'eionetSubUnitCode'	RiverBasinDistrict	'eionetRBDCode'	1)

1) Mandatory for countries not reporting under WFD (i.e. reporting under WISE-5).

2) Mandatory for countries reporting under WFD (i.e. reporting under WFD Spatial).

Using thematic identifiers to relate WFD and EIONET monitoring site identifiers

As explained before, a WFD monitoring sites is a site associated with WFD water body, even if it is not part of a WFD monitoring programme.

In the past, some WFD monitoring sites were reported using an EIONET code (i.e. using the 'eionetMonitoringSiteCode' identifier scheme). This can now be corrected using the **relatedTo** association to report the link between the former EIONET code and the correct WFD code.

Table 22. Reporting the WFD and the EIONET identifier for monitoring sites.

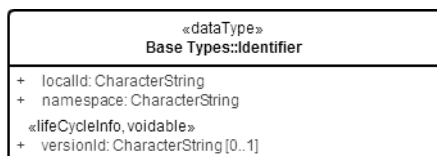
Object Type	Identifier Scheme	Association	Object Type	Identifier Scheme
MonitoringSite	'euMonitoringSiteCode'	relatedTo	MonitoringSite	'eionetMonitoringSiteCode'

Using INSPIRE identifiers

The INSPIRE data models use a base type named **Identifier** to uniquely identify spatial objects. Note that a spatial object is a representation of a real-world object: so the representation may change (e.g. the geometry may be corrected), even if the real-world object remains the same.

The INSPIRE **inspireId** data element has a complex data type: Identifier.

Figure 30. INSPIRE Identifier data type (informative only).



In the WISE spatial data sets, it must be provided using 3 separate data elements:

- **inspireIdLocalId**;
- **inspireIdNamespace** and
- **inspireIdVersionId**.

A conceptual difference exists between the thematic identifier and the INSPIRE identifier. The thematic identifier identifies a real-world object, while the INSPIRE identifier identifies the spatial object that represents it in a data set.

For many purposes, this distinction is irrelevant. However, it is important when the temporal aspects of life-cycle information need to be registered both at spatial object level and at real-world object level.

- The **inspireIdLocalId** data element is mandatory. Data Providers implementing the INSPIRE directive must provide the INSPIRE **localId** value using this element. Data Providers not implementing the INSPIRE directive should provide the national persistent unique identifier of the spatial object: the uniqueness constraint applies to all objects of the same type reported by the country.
- The **inspireIdNamespace** data element is mandatory. Data Providers implementing the INSPIRE directive are requested to provide the INSPIRE namespace using this element. Data Providers not implementing the INSPIRE directive are recommended to adopt a similar approach and referred to the document "[Designing URI Sets for Location](#)" for informative purposes.
- The **inspireIdVersionId** element is conditional. It is recommended that Data Providers report the version of the spatial object. The element is mandatory if the object has changed (i.e. if `wiseEvolutionType = 'change'`).

Relationship between **inspireId** and **thematicId**

The following text was extracted from the INSPIRE Annex III Area Management/Restriction/Regulation Zones and Reporting Units Data Specification:

*Many **ManagementRestrictionOrRegulationZone** spatial objects have been assigned multiple identifiers based on different identifier schemes that have been defined for data exchange for specific requirements (e.g. national versus European reporting). Thematic identifiers have been and shall continue to be the key used to link non-spatial data to the **ManagementRestrictionOrRegulationZone** spatial object. To ensure that none of these identifiers and links are lost, a **thematicId** has been added to the **ManagementRestrictionOrRegulationZone**.*

*The key difference between the **inspireId** and **thematicId** is that the **inspireId** shall be a persistent, unique identifier that can be used in external datasets to reference to the spatial object by any third*

party. Whereas the **thematicID** is a descriptive unique object identifier assigned to the spatial object defined in an information community.

*NOTE: A thematic identifier may form part of the **inspireId**.*

Some **ManagementRestrictionOrRegulationZone** spatial objects may be assigned more than one thematic identifier. These thematic identifiers may have been assigned to meet internal data maintenance requirements or are identification codes assigned at national, European or International level.

Special case: Using hydrographic identifiers

Hydrographic identifiers are only used in the SurfaceWaterBodyCentreline data set, relating hydrographic centreline segments to surface water bodies.

Hydrographic centrelines are part of the INSPIRE HY theme (Annex I - Hydrography) specification, under the Hydro - Network application schema. The Network application schema presents a network view of hydrographic elements, with real-world features modelled as links (**WatercourseLink**) and nodes (**HydroNode**).

The INSPIRE HY theme does not include thematic identifiers (because Annex I data specifications were developed before thematic identifiers were introduced as a base data type in the Annex II and Annex III data specifications).

However, all hydrographic objects in the INSPIRE HY theme have a **hydroId** element with a similar meaning. The INSPIRE **hydroId** has a complex data type called **HydroIdentifier**.

*Figure 31. INSPIRE **HydroIdentifier** data type (informative only).*

«dataT ype» Hydro - base::HydroIdentifier	
+	classificationScheme: CharacterString [0..1]
+	localId: CharacterString
+	namespace: CharacterString

For WISE reporting purposes, this hydrographic identifier will be treated as a thematic identifier:

- The **classificationScheme** is not required.
- The **HydroIdentifier localId** is a unique identifier in the scope of the corresponding **namespace**.

Further information is provided on the section “Reporting surface water body centrelines”.

Using identifiers in the WISE spatial data reporting

In the examples in this section, two hypothetical countries are used:

- XZ, a country reporting under WFD and WISE-5;
- ZZ, a country reporting only under WISE-5.

Reporting the identifier for spatial objects

Monitoring sites

Monitoring sites include:

- WFD monitoring sites, i.e. monitoring sites observing a WFD water body
- EIONET monitoring sites, monitoring sites observing an EIONET water body.

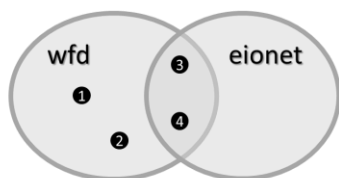
For countries reporting under WFD, the WFD monitoring site code is always the preferred identifier. The old EIONET identifier must be reported in the **relatedTo** elements (see Figure 32).

For countries not reporting under the WFD, the EIONET identifier must be used.

Note that the thematic identifier of a monitoring site must be unique, i.e. a groundwater monitoring site and a surface water monitoring site must not have identical identifiers.

Figure 32. Reporting the identifier of monitoring sites.

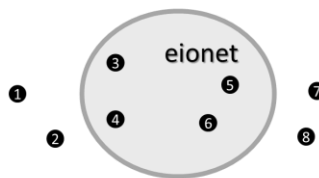
Monitoring sites in country XZ



thematicID Identifier	thematicID IdentifierScheme	relatedTo Identifier	relatedTo IdentifierScheme
XZ1	euMonitoringSiteCode	-	-
XZ2	euMonitoringSiteCode	-	-
XZ3	euMonitoringSiteCode	XZeionetCodeForSite3	eionetMonitoringSiteCode
XZ4	euMonitoringSiteCode	XZeionetCodeForSite4	eionetMonitoringSiteCode

Note: report under WFD !

Monitoring sites in country ZZ



thematicID Identifier	thematicID IdentifierScheme	relatedTo Identifier	relatedTo IdentifierScheme
ZZ3	eionetMonitoringSiteCode	-	-
ZZ4	eionetMonitoringSiteCode	-	-
ZZ5	eionetMonitoringSiteCode	-	-
ZZ6	eionetMonitoringSiteCode	-	-

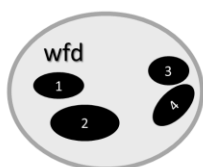
Note: report under WISE-5 !

Groundwater bodies

The same principle described above applies to groundwater bodies: the WFD groundwater body code will be used as a preferred identifier, where applicable. Figure 33 illustrates the reporting of the identifiers for a hypothetical set of water bodies.

Figure 33. Reporting the identifier of groundwater bodies.

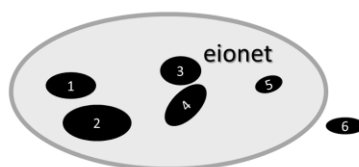
Country XZ



thematicID Identifier	thematicID IdentifierScheme
XZ1	euGroundWaterBodyCode
XZ2	euGroundWaterBodyCode
XZ3	euGroundWaterBodyCode
XZ4	euGroundWaterBodyCode

Note: report under WFD !

Country ZZ



thematicID Identifier	thematicID IdentifierScheme
ZZ1	eionetGroundWaterBodyCode
ZZ2	eionetGroundWaterBodyCode
ZZ3	eionetGroundWaterBodyCode
ZZ4	eionetGroundWaterBodyCode
ZZ5	eionetGroundWaterBodyCode

Note: report under WISE-5 !

From a thematic point of view, some situations should occur only in exceptional circumstances:

- Data Providers reporting under WFD must report all WFD groundwater bodies⁴.
- To allow European-wide assessments, Data Providers not reporting under WFD are requested to provide a comparable coverage of their national groundwater bodies. At the very least, it is required to report the water bodies for which if one or more time series will be reported under the Water Quality (WISE-4) or the Water Quantity (WISE-3) data flows.

Surface water bodies

The principle described for groundwater bodies is also applicable to surface water bodies.

Please refer to the section “Special case: reporting surface water bodies under WISE-5”.

River basin districts and sub-units

For Data Providers reporting under WFD, this information will be provided under the WFD data flow. Data Providers not reporting under WFD are requested to provide their national delineation of river basins or sub-basins, consistent with the time series reporting under WISE SoE.

The same principle illustrated in Figure 1 (cf. page 5) applies to the reporting of sub-units (sub basins). For sub-units, the correct **thematicIDIdentifierScheme** is:

- 'euSubUnitCode' for WFD subunits and
- 'eionetSubUnitCode' for sub-basins reported by Data Providers not reporting under WFD.

Refer to the section “Special case: reporting river basins under WISE” for further information.

⁴ Generically, a WFD groundwater body should be delineated in aquifers that can be used for drinking water abstraction (at least 10 m³/d as an average, or 50 persons) or support the ecological quality of a surface water body or groundwater dependent terrestrial ecosystem.

Linking spatial objects

Linking a monitoring site to a water body

Each monitoring site needs to be linked to the water body being monitored i.e. the sampled feature or "feature of interest". The two **featureOfInterest** elements are used for this purpose.

Figure 13 (cf. page 20) illustrates the reporting of WFD and EIONET monitoring sites, and their relationship to WFD or EIONET surface water bodies. If a WFD identifier exists, it will always be the preferred identifier.

Linking a sub-unit to a river basin district

Under WFD, river basin districts can be subdivided in sub-units.

By convention, if a river basin district is not subdivided, it is treated as having only one sub-unit spatially equal to the river basin district itself. This creates a hierarchical relationship similar to the one between NUTS1 and NUTS2 (statistical units).

Figure 34 illustrates a hypothetical River Basin District divided in 3 sub-units, and how to report the relationship between each sub-unit and the corresponding RBD.

Figure 34. Linking sub-units to River Basin Districts using the **relatedZone** elements.

Country XZ



thematicID Identifier	thematicID IdentifierScheme	relatedZone Identifier	relatedZone IdentifierScheme
XZRBD1S1	euSubUnitCode	XZRBD1	euRBDCode
XZRBD1S2	euSubUnitCode	XZRBD1	euRBDCode
XZRBD1S3	euSubUnitCode	XZRBD1	euRBDCode

Note: report under WFD !

Country ZZ



thematicID Identifier	thematicID IdentifierScheme	relatedZone Identifier	relatedZone IdentifierScheme
ZZRBD1S1	eionetSubUnitCode	ZZRBD1	eionetRBDCode
ZZRBD1S2	eionetSubUnitCode	ZZRBD1	eionetRBDCode
ZZRBD1S3	eionetSubUnitCode	ZZRBD1	eionetRBDCode

Note: report under WISE-5 !

Data Providers not reporting under WFD (for example, non EU countries) must follow the same approach. Note that the correct identifier schemes are 'eionetSubUnitCode' (instead of 'euSubUnitCode') and 'eionetRBDCode' (instead of 'euRBDCode').

Data providers not reporting under WFD are requested to provide the spatial data pertaining to river basins and river basin sub-units. Otherwise, the analysis and publication of the country's thematic data at European level may be impaired. RBD should be interpreted as reporting units (e.g. a main river basin or a set of contiguous river basins) and the same applies to sub-units (typically the basin of a tributary, a set of small contiguous coastal watersheds, etc.). The aggregated information reported under the Water Quantity (WISE-3) or Emissions (WISE-1) data flows need to refer to a valid RBD or sub-unit.

Linking a groundwater bodies to a river basin district

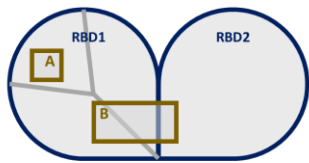
Following the principle established in the WFD reporting, each groundwater body must be related to one and only one River Basin District.

Data providers not reporting under WFD must follow the same principle, using the appropriate identifier schemes: 'eionetGroundWaterBodyCode' (instead of 'euGroundWaterCode') and 'eionetRBDCode' (instead of 'euRBDCode').

Figure 35 provides an example. Groundwater XZB illustrates a special case: if the river basin district delineation follows the surface watershed divides, a groundwater polygon (i.e. the horizontal projection of the groundwater) may extent “beyond” the watershed. In this case, the groundwater body should be assigned to the adequate river basin district (based on the groundwater recharge).

Figure 35. Linking groundwater bodies to river districts using the *relatedZone* elements.

Country XZ



thematicID Identifier	thematicID IdentifierScheme	relatedZone Identifier	relatedZone IdentifierScheme
XZA	euGroundWaterBodyCode	XZRBD1	euRBDCode
XZB	euGroundWaterBodyCode	XZRBD1	euRBDCode

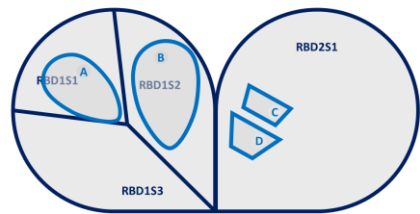
Note: report under WFD !

Linking surface water bodies to sub-units

Each surface water body is related to one and only one subunit. The principle described for groundwater bodies is applicable, with the necessary adaptations. See Figure 36.

Figure 36. Linking surface water bodies to sub-units using the *relatedZone* elements.

Country XZ



thematicID Identifier	thematicID IdentifierScheme	relatedZone Identifier	relatedZone IdentifierScheme
XZA	euSurfaceWaterBodyCode	XZRBD153	euSubUnitCode
XZB	euSurfaceWaterBodyCode	XZRBD152	euSubUnitCode
XZC	euSurfaceWaterBodyCode	XZRBD251	euSubUnitCode
XZD	euSurfaceWaterBodyCode	XZRBD251	euSubUnitCode

Note: report under WFD !

Life-cycle management

Overview

The requirements for life-cycle information in the WISE spatial data sets are stated in the following excerpt of the CIS Guidance Document No 22 (section 4.4.5):

“Member States are responsible for the unique identification of spatial objects reported to WISE and to guarantee persistence over time. [...] However two major problems arise on implementing these rules:

- Objects in the real world change over time. For example a monitoring station is removed from a network, River Basin Districts are restructured (due to changes in administrative boundaries), etc. [...]*
- As the objects are changing over time this also means that [...] references to other datasets may become obsolete.*

Member States will be responsible for:

- Maintaining the references between national data submitted to WISE as required by the respective reporting guidelines and described in the WISE data model (e.g. sensitive areas reported under UWWTD linked to water bodies reported under WFD);*
- Referencing their spatial objects to the respective objects of the WISE Reference GIS datasets and maintaining these references;*
- Maintaining correct linkages between datasets where objects have changed or new objects have been created, and updating all related datasets accordingly (e.g. if a new river water body dataset is submitted, the river monitoring stations also have to be updated because the stations are linked to river water bodies).”*

This section provides an overview on issues related to life-cycle management for the spatial objects in the different WISE spatial data sets, namely:

- How to report if a WFD water body was re-delineated since it was reported in the 2nd RBMP in 2016.
- How to report if the identifier (the code) of a WFD water body was changed, without any other relevant change to the water body itself.
- How to report if the identifier (the code) of a monitoring site has changed.
- How to report if a monitoring site has been superseded by another monitoring site (implicitly meaning that the time series of the two sites are representative of the same conditions in the monitored water body).

It also provides practical information and examples on:

- How to use the **beginLifeSpanVersion**, **endLifeSpanVersion** and **versionId** to report changes to a spatial object representation;
- How to use the **operationalActivityPeriodBegin** and **operationalActivityPeriodEnd** to report the “validity period” of a monitoring site;
- How to use the **designationPeriodBegin** and **designationPeriodEnd** to report “validity period” of water bodies, river basin districts or protected areas;
- How to report predecessors and successors to guarantee the comparability and continuity of the data when changes occur; and
- How to report the type of change using the **wiseEvolutionType** element.

Please read the section on “Identifier management” for information on the proper use of thematic identifiers to uniquely identify spatial objects in WISE.

This section builds extensively on the concepts and examples in Annex F on the INSPIRE SU theme (Annex III - Statistical Units) data specification.

Life-cycle information

Life-cycle management has different complementary aspects:

- To keep track of the status of real-world entities;
- To keep track of the status of their representation, as objects in a data set;
- To keep track of their longitudinal succession in time.

The life-cycle of each real-world entity is registered using the following elements:

- For monitoring sites:
 - **operationalActivityPeriodBegin**;
 - **operationalActivityPeriodEnd**.
- For water bodies, sub-units, river basin districts and protected areas:
 - **designationPeriodBegin**;
 - **designationPeriodEnd**.

The life-cycle of each spatial object in the data set is registered using the following elements:

- **beginLifeSpanVersion**;
- **endLifeSpanVersion**;
- **versionId** (if the Data Provider chooses to report it explicitly as recommended).

This set of elements allows the creation of snapshots, i.e. data sets that include the spatial objects representing the real-world entities that are valid at a given moment in time.

However, tracking their succession in time requires two additional elements: **predecessors** and **successors**. Using these elements, an explicit log can be kept of any longitudinal changes in the data sets. (Note that for monitoring sites, the equivalent elements are **supersedes** and **supersededBy**.)

One final element is used: **wiseEvolutionType**. It registers the type event that generated the object. Some options are only valid for specific object types.

Figure 37. Valid options for the **wiseEvolutionType** element.

«Enumeration» WiseEvolutionTypeValue
creation deletion aggregation splitting change changeCode changeBothAggregationAndSplitting changeExtendedArea changeExtendedDepth changeExtendedAreaAndDepth changeReducedArea changeReducedDepth changeReducedAreaAndDepth noChange reactivation

Creation

If a new spatial object is to be created in the WISE spatial reference data sets (e.g. a new WFD water body that was not designated in the 2nd RBMPs), then:

- The **wiseEvolutionType** element must have the value 'creation';
- The **beginLifespanVersion** element must be filled with a valid date;
- It is strongly recommended to provide a **versionId**: this element is relevant when there are future changes to the object (e.g. minor changes in the geometry, or corrections/updates to other information that does not change the identity of the object itself).

For monitoring sites, the **operationalPeriodBegin** element must be provided, with a valid **DateTime** value. For other spatial objects – water bodies, sub-units, RBDs, protected areas – the **designationPeriodBegin** element must be provided, with a valid **DateTime** value.

The following rules apply:

- If the new object does not replace an existing object, then it will have no predecessors.
- If the new object replaces any existing object(s), then it will have 1 (or more) predecessors. In this case, it is necessary to use the appropriate **wiseEvolutionType** ('changeCode', 'splitting', 'agregation', etc.) depending on the type of operation that created the new object.
- If object A identifies object B as a predecessor, then object B must identify object A as a successor.

Typically, a new object is not supposed to have successors (i.e. it is supposed to be valid and operational). However, exceptional situations may require the reporting of a previous unreported object that is no longer operational. If the object was never reported and its identifier is not listed in the WISE register, the recommended procedure is to use the following two steps:

- Provide the previously unreported object, using **wiseEvolutionType** ='creation'.
- Provide an update to that object, using **wiseEvolutionType** ='deletion' and specifying its successors.

The following exclusions apply:

- If the object was already reported and has not been replaced, then use the option 'noChange'. This option must be used for the WFD water bodies that haven't changed from the 2nd to 3rd RBPM.
- If the object was already reported and has been replaced, then use the option 'deletion'. This option must be used for the WFD water bodies from the 2nd RBPM that are no longer in use for the 3rd RBPM. If the object was replaced, then one or more successors should be identified.
- If the new object is created from an existing object via a splitting operation, then use the option 'splitting'. One and only one predecessor must be identified.
- If the new object is created from existing objects via an aggregation operation, then use the option 'aggregation'. Two (or more) predecessors must be identified.
- If the new object is created from existing objects via a hybrid operation involving both aggregation and splitting, then use the option 'changeBothAggregationAndSplitting'. Two (or more) predecessors must be identified.
- If the new object modifies an existing object then use the relevant **wiseEvolutionType** value: 'changeExtendedArea', 'changeExtendedDepth', 'changeExtendedAreaAndDepth', 'changeReducedArea', 'changeReducedDepth', 'changeReducedAreaAndDepth'. See further information under the section "Changes in the spatial extent".
- If there has been a change in the identifier, use the option 'changeCode', and report the previous identifier in the **predecessors** elements (or the **supersedes** elements, if it is a monitoring site).

Aggregation

If a new spatial object results from the aggregation of previously reported spatial objects (e.g. a new WFD water body resulting from the aggregation of two water bodies reported in the 2nd RBMPs), then:

- The **wiseEvolutionType** element must have the value 'aggregation'.
- The **beginLifespanVersion** element must be filled with a valid **DateTime**.
- It is strongly recommended to provide a **versionId**: this element is relevant when there are future changes to the object (e.g. minor changes in the geometry, or corrections/updates to other information that does not change the identity of the object itself).

Note that aggregation is applicable to real-world surfaces – which are usually represented by polygons. However, the cartographic representation may also be a polyline or even a (representative) point. So, the aggregation operation can also be reported for polyline and point data sets.

For monitoring sites, the **operationalPeriodBegin** element must be provided, with a valid **DateTime** value. For other spatial objects – water bodies, sub-units, RBDs, protected areas – the **designationPeriodBegin** element must be provided, with a valid **DateTime** value.

Two (or more) predecessors must be reported.

- If object A identifies object B as a predecessor, then object B must identify object A as a successor.

The following constraints are applicable (and used to control the validity of the reported data):

- The new objects must not reuse the thematic identifier of any replaced object.
- Aggregation of monitoring sites is valid if all are located within the same water body.
- Aggregation of surface bodies is valid if the resulting water body is located in the same sub-unit. (If the geometry of the original water bodies is available, additional checks are performed).
- Aggregation of groundwater bodies is valid if the resulting water body are located in the same river basin district.

(If the geometry of the original waterbodies is available, additional checks are performed.)

Splitting

If a new spatial object results from the splitting of a previously reported spatial object (e.g. a new WFD water body resulting from the splitting of a water body reported in the 2nd RBMPs), then:

- The **wiseEvolutionType** element must have the value 'splitting'.
- The **beginLifespanVersion** element must be filled with a valid **DateTime**.
- It is strongly recommended to provide a **versionId**: this element is relevant when there are future changes to the object (e.g. minor changes in the geometry, or corrections/updates to other information that does not change the identity of the object itself).

Note that splitting is applicable to real-world surfaces – which are usually represented by polygons. However, the cartographic representation may also be a polyline or even a (representative) point. So, the splitting operation can also be reported for polyline and point data sets.

For monitoring sites, the **operationalPeriodBegin** element must be provided, with a valid **DateTime** value. For other spatial objects – water bodies, sub-units, RBDs, protected areas – the **designationPeriodBegin** element must be provided, with a valid **DateTime** value.

One predecessor must be reported.

- If object A identifies object B as a predecessor, then object B must identify object A as a successor.

The following constraints are applicable (and used to control the validity of the reported data):

- The new objects must not reuse the thematic identifier of any replaced object.
- Splitting of monitoring sites is valid if all are located in the same water body.
- Splitting of a surface body is valid if the resulting water bodies are spatially adjacent and all are located in the same sub-unit.
- Splitting of a groundwater body is valid if the resulting water bodies are spatially adjacent and all are located in the same river basin district.

(If the geometry of the original waterbodies is available, additional checks are performed.)

Combined aggregation and splitting

If a new spatial object results from a complex operation involving both the splitting and aggregation of previously reported spatial objects, then:

- The **wiseEvolutionType** element must have the value 'changeBothAggregationAndSplitting'.
- The **beginLifespanVersion** element must be filled with a valid **DateTime**.
- It is strongly recommended to provide a **versionId**: this element is relevant when there are future changes to the object (e.g. minor changes in the geometry, or corrections/updates to other information that does not change the identity of the object itself).

Two or more predecessors must be reported.

- If object A identifies object B as a predecessor, then object B must identify object A as a successor.

The constraints in the sections on “Aggregation” and “Splitting” are applicable in this case.

Changes in the spatial extent

If the spatial object results from changes to spatial extent of a previously existing object (typically a water body or a protected area), then:

- The **wiseEvolutionType** value must have the relevant value for the specific situation been reported: 'changeExtendedArea', 'changeReducedArea', 'changeExtendedDepth', 'changeExtendedAreaAndDepth', 'changeReducedDepth', 'changeReducedAreaAndDepth'.
- The options involving changes in the depth are applicable only to groundwater bodies.
- The **beginLifespanVersion** element must be filled with a valid **DateTime**.
- It is strongly recommended to provide a **versionId**: this element is relevant when there are future changes to the object (e.g. minor changes in the geometry, or corrections/updates to other information that does not change the identity of the object itself).

With regard to identifiers, the changed object must be treated as new object, with a new unique thematic identifier: then the original object must be listed as a **predecessor**.

Changes in the identifier of an object

In special cases, the identifiers used at national level may change although the real-world entities have not changed. Since the European identifiers are derived from the national identifiers (by concatenating the 2-letter country code as a suffix to the national code), this change needs to be propagated to the WISE spatial data sets.

Conceptually, if the identifier changes, then the object is no longer the same as before, and it replaces the one with the old identifier.

- The **wiseEvolutionType** element must have the value 'changeCode';
- The **beginLifespanVersion** element must be filled with a valid **DateTime**;
- It is strongly recommended to provide a **versionId**: this element is relevant when there are future changes in the object (e.g. minor changes in the geometry, or corrections/updates to other information that does not change the identity of the object itself).

For monitoring sites, the **operationalPeriodBegin** element must be provided, with a valid **DateTime** value. For other spatial objects – water bodies, sub-units, RBDs, protected areas – the **designationPeriodBegin** element must be provided, with a valid **DateTime** value.

One predecessor must be identified: the object bearing the old identifier.

Changes in the geometry

Some changes do not affect the identity of a previously reported object, but create a new version of an existing object. For example, if the location of a monitoring site can be reported with better accuracy or precision than previously reported. Or if the delineation of a water body has changed only because a new survey is available with better geometric accuracy or precision.

If an update is provided to the geometry of a previously reported object, then:

- The **wiseEvolutionType** element must have the value 'change';
- The **beginLifespanVersion** element must be filled with a valid **DateTime**;
- The **versionId** element needs to be updated with regard to the value in the original version of the object.

Note also that the original version of the object will be updated (specifically the **endLifeSpanVersion** value) in the European dataset (there is no need to report that version again).

Note that the object is the same: it's just a newer version. Note also that the concept of successors and predecessors is applicable at object level, not at version level. So, if the old version of the object had predecessors (and/or successors), then the new version of the object maintains the same predecessors (and/or successors).

No changes

In other situations, the update does not create a new version of an existing object. For example, missing information may be available that was not previously reported. In these situations:

- The **wiseEvolutionType** element must have the value 'noChange'.

The remaining values may change as appropriate.

Note that this option must be used for the WFD water bodies that haven't changed from the 2nd to 3rd RBPM.

Deletion

If a WFD spatial object was reported in the 2016 reporting exercise and is not reported in the 2022 reporting exercise because it no longer exists (as opposed to the cases in which it was aggregated or split into new objects), then the object should be reported as 'deletion'. This is to avoid problems of interpretation (if the object is not reported, this could be due to the object not existing but also to an involuntary omission).

If a previously reported spatial object will no longer be valid, then:

- The **wiseEvolutionType** element must have the value 'deletion';
- The **endLifespanVersion** element must be filled with a valid **DateTime**.

Note the **endLifespanVersion** value must be posterior to the **beginLifespanVersion** value.

If a monitoring site will no longer be reported because it is no longer active or monitored in the real world, the **operationalPeriodEnd** element must be provided, with a valid **DateTime** value.

Note the **operationalPeriodEnd** value must be posterior to the **operationalPeriodBegin** value.

For other spatial objects – water bodies, sub-units, RBDs, protected areas – the **designationPeriodEnd** element must be provided, with a valid **DateTime** value.

Note the **designationPeriodEnd** value must be posterior to the **designationPeriodBegin** value.

The following principles apply:

- If the object will not be replaced, then it has no successors.
(Note that, for monitoring sites, this will break the time series of reported data.)
- If other objects will replace it, then 1 (or more) successors must be identified.
(A comma-separated list of their identifiers must be provided as the value of the element.)
(Note that, for monitoring sites, the time series data previously reported for the deleted site will be considered representative of the conditions at the “new” site, i.e. the time series will be merged.)
- If object A identifies object B as a predecessor, then object B must identify object A as a successor.

For monitoring sites, successors must be reported using the **supersededBy** elements.

For other types of spatial objects, successors must be reported using the **successors** elements.

Reactivation of monitoring sites

The reactivation of monitoring sites is an option designed in response to a request by Data Providers. Some monitoring sites present in the 1st River Basin Management Plans reporting in 2010 were afterwards reported as 'deletion' in the 2nd River Basin Management Plans reporting in 2016. These monitoring sites may now again be included in the 3rd River Basin Management Plans reporting using the option 'reactivation'. For Data Providers that do not report under the Water Framework Directive, reactivation of EIONET sites is also possible in the WISE-5 reporting, subject to the same principles listed below.

The following principles apply:

- The **wiseEvolutionType** value 'reactivation' can only be applied to monitoring sites that are present in the WISE register (see [MonitoringSite](#)) and have status 'deprecated' or 'retired' (see page 73).
- A monitoring site reported as 'reactivation' cannot have any successors.
- A monitoring site reported as 'reactivation' and previously associated with a surface water body must still be associated with a surface water body; likewise for groundwater body monitoring sites.
- A monitoring site reported as 'reactivation' cannot be associated with a water body reported as 'deletion'.
- A monitoring site reported as 'reactivation' cannot be associated with a water body with status 'deprecated', 'retired' or 'superseded' in the WISE register (see [WaterBody](#)).

Special case: constraints and quality control

Spatial objects marked for 'deletion' are excluded from the quality control procedures applicable to the remaining “valid” objects in the data set.

Special case: invalid objects

Invalid objects are objects reported by mistake. There will be no automated mechanism to purge invalid objects – as this is considered an exceptional situation that shall require human intervention and oversight.

Please contact helpdesk (wfd.helpdesk@eionet.europa.eu or wisesoe.helpdesk@eionet.europa.eu, depending on the reporting obligation).

Note on the WISE register

(This note is provided for information only. It does not affect the reporting process.)

The WISE register contains the list of known identifiers for river basin districts, sub-units, water bodies and monitoring sites. It facilitates the reuse of the WISE identifiers across different data flows and reporting obligations.

register

set of files containing identifiers assigned to items with descriptions of the associated items [ISO 19135]

registry

information system on which a register is maintained [ISO 19135]

Source: http://inspire.ec.europa.eu/documents/Data_Specifications/D2.5_v3.4.pdf

The WISE register is part of the EIONET register at <http://dd.eionet.europa.eu/vocabularies>. The EIONET vocabularies are structured according to the SKOS ([Simple Knowledge Organization System](#)) data model.

Example: using the SpatialUnit vocabulary

The <http://dd.eionet.europa.eu/vocabulary/wise/SpatialUnit> register currently contains 3 types of spatial units: countries, river basin districts and sub-units (Figure 38).

Figure 38. SpatialUnit vocabulary.

Vocabulary: Spatial units

Get RDF output of this vocabulary
Get CSV output of this vocabulary
Get XML output in INSPIRE codelist format
Get JSON-LD output of this vocabulary

Folder	wise (WISE - Water Information System for Europe)
Identifier	SpatialUnit
Label	Spatial units
Base URI	http://dd.eionet.europa.eu/vocabulary/wise/SpatialUnit/
Registration status	Released
Type	Common

Vocabulary concepts

Filters

Status: Add filter

Filtering text:

inCountry:

Options

Search

6 concepts found, displaying all concepts. 1

Id	Preferred label	Status	Status Modified	Notation
countryCode.HR	Croatia	Valid		HR
euRBDCode.HRC	DANUBE	Valid		HRC
euRBDCode.HRJ	ADRIATIC	Valid		HRJ
euSubUnitCode.HRD	DANUBE	Valid		HRD
euSubUnitCode.HRJ	ADRIATIC	Valid		HRJ
euSubUnitCode.HRS	DANUBE	Valid		HRS

Each concept has an URI, e.g. <http://dd.eionet.europa.eu/vocabulary/wise/SpatialUnit/euRBDCode.AT1000>. The link provides basic information about the spatial unit, which in this case is an Austrian river basin district (Figure 39).

Figure 39. Information about the identifier of a river basin district.

Concept URI	http://dd.eionet.europa.eu/vocabulary/wise/SpatialUnit/euRBDCode.AT1000
Preferred label	DANUBE
Definition	River basin district
Notation	AT1000
In country	AT (Austria) in common/countries
Identifier scheme	euRBDCode (euRBDCode) in wise/IdentifierScheme
Status	stable (Valid - stable) in datadictionary/status

Similarly, each subunit within AT1000 has a unique URI. For example: <http://dd.eionet.europa.eu/vocabularyconcept/wise/SpatialUnit/euSubUnitCode.AT1100>. Each sub-unit has an additional predicate: the related zone, i.e. the river basin it belongs to (Figure 40).

Figure 40. Information about the identifier of a river basin district sub-unit.

Concept URI	http://dd.eionet.europa.eu/vocabulary/wise/SpatialUnit/euSubUnitCode.AT1100
Preferred label	DANUBE
Definition	River basin district sub unit
Notation	AT1100
In country	AT (Austria) in common/countries
Identifier scheme	euSubUnitCode (euSubUnitCode) in wise/IdentifierScheme
Status	stable (Valid - stable) in datadictionary/status
Related zone	euRBDCode.AT1000 (DANUBE) in wise/SpatialUnit

Information about the life-cycle of identifiers is also available. For example, in the 2016 WFD reporting, Ireland reported a single river basin district that replaced the river basin districts reported in the 2010 exercise (Figure 41).

Figure 41. Information about the identifier of a river basin district that replaces previously reported identifiers.

Concept URI	http://dd.eionet.europa.eu/vocabulary/wise/SpatialUnit/euRBDCode.IEROI
Preferred label	IRELAND
Definition	River basin district
Notation	IEROI
In country	IE (Ireland) in common/countries
Replaces	euRBDCode.IEEA (EASTERN) in wise/SpatialUnit euRBDCode.IEGBNISH (SHANNON) in wise/SpatialUnit euRBDCode.IESE (SOUTH EASTERN) in wise/SpatialUnit euRBDCode.IESW (SOUTH WESTERN) in wise/SpatialUnit euRBDCode.IEWE (WESTERN) in wise/SpatialUnit
Identifier scheme	euRBDCode (euRBDCode) in wise/IdentifierScheme
Status	stable (Valid - stable) in datadictionary/status

Each of the former river basin districts is kept in the register (Figure 42). Note however that the status is superseded, because the spatial unit has been replaced. The link to the new river basin district is provided.

Figure 42. Information about the identifier of a river basin district that has been replaced by a new identifier.

Concept URI	http://dd.eionet.europa.eu/vocabulary/wise/SpatialUnit/euRBDCCode.IEEA
Preferred label	EASTERN
Definition	River basin district
Notation	IEEA
In country	IE (Ireland) in common/countries
Is replaced by	euRBDCCode.IEROI (IRELAND) in wise/SpatialUnit
Identifier scheme	euRBDCCode (euRBDCCode) in wise/identifierScheme
Status	superseded (Deprecated - superseded) in datadictionary/status

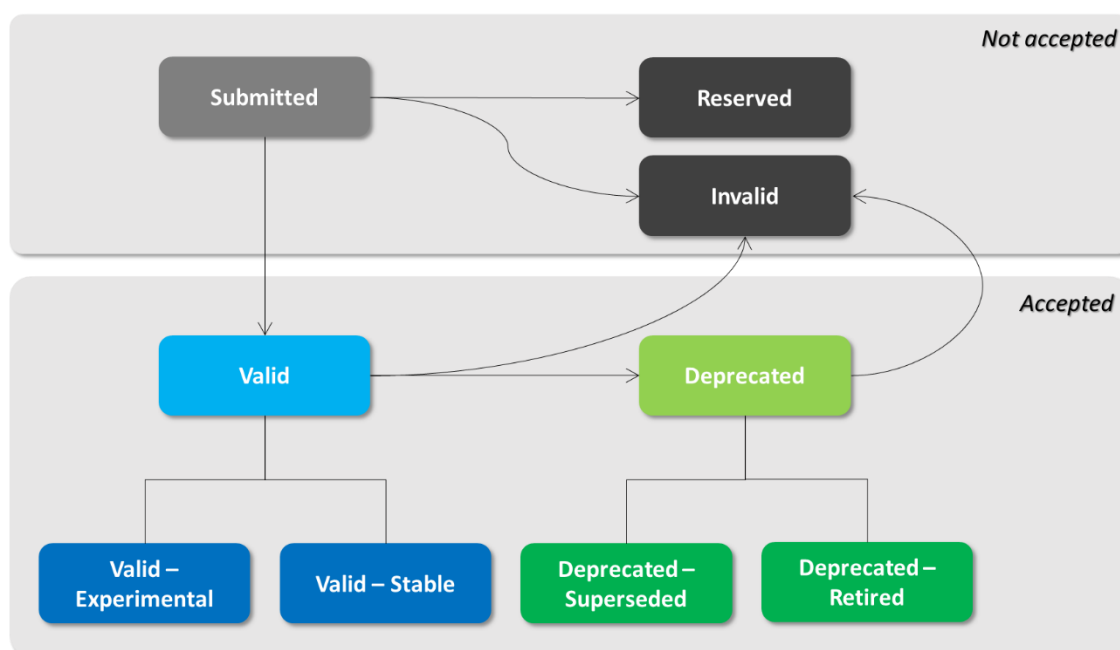
About the status of a concept

Each concept has an associated status (Figure 43).

The different possible statuses are defined in <http://dd.eionet.europa.eu/vocabulary/datadictionary/status>.

The section provides an overview of the different statuses and of their use in the context of the identifiers register and of the data quality control.

Figure 43. Status.



Not accepted is an abstract status that includes:

- **Submitted** - Used for identifiers that haven't been evaluated (e.g. passed quality control). Can be seen as an internal initial state.
- **Reserved** - Used for reserved identifiers that cannot be used for real spatial units.
- **Invalid** - Used for identifiers that cannot not be used in the current reporting.

The invalid state is applied to “wrong” identifiers – e.g. identifiers that were used in the past, but that do not follow the current syntax requirements for identifiers, or identifiers that the Data Provider flagged as being wrong. Invalid spatial identifiers can be replaced by other identifiers.

Not accepted identifiers should not be used in the reporting. Depending on the requirements of each specific data flow or spatial data set, using one of these identifiers in a data delivery can trigger:

- a BLOCKER, i.e. the data cannot be delivered;
- an ERROR, i.e. the data can be delivered but a resubmission will probably be requested; or
- a WARNING, i.e. the data can be delivered but a resubmission may be requested or the data may not be publishable.

Accepted is an abstract state that includes valid and deprecated identifiers.

Valid identifiers include 'valid – **experimental**' and 'valid – **stable**' identifiers.

Deprecated identifiers include 'deprecated – **superseded**' and 'deprecated – **retired**' identifiers.

Depending on the requirements of each specific data flow or spatial data set, the data delivery may include any accepted identifier, or only valid identifiers, or only valid – stable identifiers, etc...

The default approach is that any accepted identifier can be used.

Valid – stable identifiers are syntactically correct, no issue has been detected in the spatial object previously reported by the Data Provider, and refer to an active valid real world entity (as far as the Data Requester knows).

Valid – experimental identifiers are syntactically correct identifiers that are proposed by the Data Requester (i.e. the EEA or DG ENV) to replace invalid identifiers.

These identifiers were never reported by countries. They are proposed as a replacement for an invalid identifier that was reported by in the past (e.g. an identifier that had special characters). If countries accept the change and use it in the reporting, then the identifier state will be changed to '**valid – stable**', '**deprecated – superseded**' or '**deprecated – retired**' (depending on what is reported, see definitions below).

Valid identifiers are syntactically correct identifiers reported by the Data Provider. However issues have been detected with the spatial object itself (e.g. the name is missing and/or the geometry needs to be checked), so the identifier cannot be marked as 'valid – stable'. Valid identifiers may replace 'deprecated' identifiers or 'invalid' identifiers (the same applies to 'valid – stable' or valid – experimental identifiers).

Deprecated – superseded identifiers are syntactically correct identifiers that are known to have been replaced by another identifier (as reported by Data Providers in the normal reporting process, using the life-cycle information attributes).

Deprecated – retired identifiers are syntactically correct identifiers that are no longer used and have not been replaced (e.g. a monitoring site that is no longer operational and has not been replaced by a different one).

Deprecated identifiers are syntactically correct identifiers that were valid in the past. This status is only used when there is not enough information to know if the identifier has been superseded or retired.

(In exceptional circumstances, valid or deprecated identifiers may later be found to be invalid.)

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