



# INSPIRE

Infrastructure for Spatial Information in Europe

## MIWP Action progress and review – For endorsement

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<b>Type</b>	Document for discussion and endorsement
<b>Creator</b>	EC and EEA INSPIRE Team
<b>Date/status/version</b>	06/03/2020 / Final
<b>Addressee</b>	MIG
<b>Identifier</b>	<b>MIG/11/2020/DOC7</b>
<b>Description</b>	<p>Final report on deliverables for endorsement and closure of the actions:</p> <ul style="list-style-type: none"> <li>• 2017.3 Better client support for complex GML</li> <li>• 2017.4 Validation &amp; Conformity</li> </ul> <p>New action mandate for endorsement</p> <ul style="list-style-type: none"> <li>• 2020.1 OGC API – Features</li> </ul>
<b>actions:</b>	<p>MIG to:</p> <ul style="list-style-type: none"> <li>• take note of and endorse the results of action 2017.3 and close the action;</li> <li>• take note of and endorse the results of action 2017.4 and close the action;</li> <li>• endorse the creation of a network of National Contact Points focused on validation;</li> <li>• endorse the action mandate 2020.1 on INSPIRE Download Services based on the OGC API – Features standard</li> </ul>

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## 1 Close action 2017.3 - Improved client support for INSPIRE data

The INSPIRE data specification TGs define (complex) xml schemas based on GML as the default encoding for all INSPIRE spatial data themes. Many existing (web, desktop and mobile) applications and tools have difficulties in consuming and/or fully making use of data shared according to these schemas.

The INSPIRE xml schemas are complex because they are generated automatically from the conceptual UML model (according to the normative UML-to-GML encoding rules described in the GML standard and INSPIRE Technical Guidelines D2.7 Encoding Guidelines) and therefore reflect all the complex structures present in the conceptual model. In contrast, most existing clients, including the popular GDAL/OGR open source library (that is underlying most OS and proprietary client solutions) consumes and writes flat data structures, where e.g. each attribute can only have at most one value and attributes can have only simple types (e.g. integer, string, boolean). This means that, while INSPIRE data encoded according to the current schemas can be downloaded and viewed, simple use of the data (cartographic visualisation, simple joins, visual overlays, spatial search, ...) is difficult in standard GIS clients.

One way to address this gap is to encourage better support by vendors for the current (GML-based) INSPIRE encoding.

Some vendors and projects have already started to improve the support for GML. However, different projects/vendors implement different (arbitrary subsets) of GML/XML. In addition, there is no analysis of the subset of XML schema (and GML) that is required in INSPIRE, including for specific INSPIRE themes that may need to deal with this complexity.

Within this context, the action aimed to:

1. Investigate use cases and requirements for improved client support.
2. Discuss with the open source community and commercial vendors how to improve support for INSPIRE data, in client (web, desktop and mobile) software.
3. Investigate means for consumption of INSPIRE data directly from National and European discovery services

More specifically, it carried out the following tasks:

1. In collaboration with thematic communities (through the Thematic Clusters platform and the MIG-T), identify test datasets available in INSPIRE encodings (GML-based or alternative encodings discussed in action 2017.2) and relevant use cases.
2. Conduct a study on the usability of the test INSPIRE datasets identified in Task 1 in different libraries (OGR/GDAL), desktop and web clients (e.g. Quantum GIS, ESRI ArcGIS for Desktop, LeafletJS, OpenLayers) and analytical or ETL tools for data processing (e.g. HALE, FME, R). Depending on the selected use cases, the study could also investigate the usability in other client tools or applications outside of the GI domain that could make use of INSPIRE data.
3. Organise, together with the open source community and commercial vendors, events to discuss the findings of the study and identify the way forward to improve the client support for INSPIRE data (and, if appropriate, possible follow-up actions for the MIWP in 2019).
4. Prioritise tools and specific functionalities that should be improved or developed, including the proposal for an approach for stakeholder collaboration (potentially including co-funding) for tool improvements.

5. Investigate good practices for the implementation of the publish – find – bind paradigm (e.g. direct use of data based on its metadata) for national and EU INSPIRE metadata and catalogues.

## 1.1 Results

The outputs of the Action are made available on [GitHub](#). The work was carried out by the JRC and supported by a contractor. No temporary sub-group was established in support of the Action.

The results include the following:

- Usability testing framework for different data encodings (currently GeoJSON and GML, but also reusable for other alternative encodings such as GeoPackage).
- [Test suite](#) for testing different usability aspects of INSPIRE data, such as data loading, visualisation and geoprocessing.
- [Can-I-use tool](#), providing synthesised overview of the client support for INSPIRE data (i.e. which client supports which functionality) for the following clients applications: QGIS, GRASS GIS, ArcMap Desktop, ArcGIS Pro, ArcGIS Online, hale studio, FME Desktop, OpenLayers and LeafletJS.
- Overview of the [technical issues](#) of the abovementioned client applications for consumption of INSPIRE data.
- Prioritisation for resolution of the identified issues (both from a software project and data provider perspectives).
- A face to face meeting with software projects and vendors, data providers, and experts in data encoding took place in Ispra on 8 and 9 July 2019. The agenda of the meeting is available [here](#).

## 2 Close action 2017.4 - Validation & Conformity

[Action 2017.4 on validation and conformity testing](#) was started at the beginning of 2018 to setup a sub-group of MIG-T representatives and experts aimed at supporting the development and further evolution of the INSPIRE Reference Validator, considered a tool of primary importance for the practical implementation of INSPIRE. The tasks of the sub-group were the following:

- coordinate the maintenance of the existing framework, ATS and ETS and the development of the missing ATS and ETS, including coordination of funding and release planning and clear communication of changes between releases,
- discuss how the maturity level concept can be reflected in the common validator,
- coordinate the funding of the maintenance and further developments,
- promote the usage of the validator in the MS,
- advise the EC on different scenarios for the long-term sustainability of the test framework.

After two years since the creation of the Action and the sub-group, the INSPIRE Reference Validator has become a mature tool used on a daily basis by an increasing number of implementers and data providers. In the last two years the Validator has substantially evolved in line with the needs of the INSPIRE community. In addition to the new tests (for MD TG 2.0, WMS and WMTS View Services, WCS and SOS Download Services, and CSW Discovery Services) added to those available in early 2018, a number of other components have been also improved:

- a [release planning strategy](#) was formalized to describe the plan for future releases;

- the [helpdesk](#) was re-organized to allow a more efficient and transparent management of the issues and improvement proposals from the community;
- a [project board](#) was setup to transparently communicate the implementation stage of the solution to each open issue;
- the Validator was moved to the cloud to meet the needs of an increased user community, and a [staging instance](#) was setup in addition to the [production instance](#) to facilitate community testing of new functionality before their official release;
- a [changelog](#) is published together with each release.

In addition, a formal [governance structure](#) based on a Steering Group and a Technical Committee, where the JRC is involved, has been put in place for the [ETF framework](#), which is the open source software representing the core of the INSPIRE Reference Validator.

The contribution of the sub-group to such important results has been significant, especially during the first year of activity (2018). Instead, the contribution has progressively decreasing in the second year, during which only 3 meetings took place out of the 11 from the whole biennium. In the last months the number of active sub-group members has decreased and the JRC has received little input from the sub-group, both outside and during the meetings (which is also one of the reasons why the number of meetings was reduced in 2019).

Therefore, considering that the Action objectives have been achieved and in full alignment with the proposed date of completion (30/12/2019) included in the Action mandate, **we request to formally close Action 2017.4.**

*To ensure a continuous support to the development of the INSPIRE Reference Validator and make sure it remains aligned with the needs of MS, we propose to replace the 2017.4 sub-group by setting up a mechanism similar to the one existing for the INSPIRE Geoportal, i.e. **a network of National Contact Points focused on validation**. Members of this network should be the maintainers/administrators of national validators (if available) and/or national experts in INSPIRE validation and conformity. They should be in charge of:*

- *staying up-to-date on the latest developments of the Validator;*
- *monitoring the issues raised in the Validator helpdesk as well as the relevant discussions in the INSPIRE Community Forum, and providing expert feedback;*
- *contributing to testing new developments (e.g. new tests or functionality) of the Validator;*
- *representing the bridge between the EC/JRC and the national validation communities, promoting the use of the Validator and reporting about validation efforts at the national level;*
- *advising on the long-term sustainability of the Validator, including coordination of funding.*

*A dedicated mailing list should be setup to facilitate sharing of news and agreeing common actions.*

### 3 New action 2020.1 OGC API – Features

<b>Title</b>	<b>INSPIRE Download Services based on the OGC API – Features standard</b>			
<b>ID</b>	MIWP-2020-1			
<b>Status</b>	<input checked="" type="checkbox"/> Proposed	<input type="checkbox"/> Endorsed	<input type="checkbox"/> In Progress	<input type="checkbox"/> Completed
<b>Date of last update</b>	18 March 2020			
<b>Issue</b>	<p>Several possible solutions for implementing download services are already endorsed by the INSPIRE Maintenance and Implementation (MIG) group. <a href="#">Technical guidelines documents</a> are available that cover implementations based on ATOM, WFS 2.0, WCS and SOS. While all of these approaches use the Web for providing access to geospatial data, the new family of <a href="#">OGC API standards</a> will modernise the way geospatial content is exchanged via the Web. An OGC API will provide proper machine-readable and human-readable documentation, thereby requiring less up-front knowledge of the standards involved from developers. OGC API standards currently build on the OpenAPI 3.0 Specification, a broadly adapted industry standard that is implemented by <a href="#">many tools</a>. In addition, OGC API standards are aligned with the W3C <a href="#">Data on the Web Best Practices DWBP Best Practice 23</a> and <a href="#">DWBP Best Practice 24</a>.</p> <p>In particular, the <a href="#">OGC API - Features standard<sup>1</sup></a> provides API building blocks for the creation, modification and query of features on the Web. OGC API - Features is comprised of multiple parts, and each of them is a separate standard.</p> <p>In response to this emerging trends a <a href="#">Draft guideline</a> describing how to setup an INSPIRE Download service based on the OGC API - Features standard has been prepared within the context of the INSPIRE MIG-T.</p>			
<b>Proposed action</b>	<p>The <b>overall objective</b> of this action is to prepare and submit for approval by the MIG an INSPIRE good practice dedicated to the use of the OGC API Features as an INSPIRE Download service. In addition, the action should capture and document all issues and lessons learnt for the technological evolution of INSPIRE into a European environmental data space.</p> <p>The participation of data providers, software vendors, open source projects and representatives of standardisation bodies is foreseen.</p>			
<b>Link to REFIT evaluation</b>	Specific proposed action to "assist the Member States in applying and implementing the INSPIRE Directive (simplification of use), e.g. by the use of common tools, and promote priority setting together with the Member States " (page 12 of COM(2016)478).			
<b>Links &amp; dependencies</b>	Dependencies:			

<sup>1</sup> The OGC API-Features was previously known as Web Feature Service (WFS) 3.0

Title	INSPIRE Download Services based on the OGC API – Features standard
	<ul style="list-style-type: none"> <li>• <a href="#">OGC API – Features – Part 1: Core standard</a></li> <li>• <a href="#">Open API Specifications</a></li> </ul> <p>Links:</p> <ul style="list-style-type: none"> <li>• <a href="#">Rules for encoding of INSPIRE data through the GeoJSON standard</a> developed by MIG Action 2017.2 (concluded);</li> <li>• <a href="#">Testing framework</a> developed within the context of the MIG Action 2017.3 (concluded) concerning the client support for INSPIRE data.</li> <li>• Action 2017.4 on validation and conformity testing (development of ATS and ETS)</li> </ul>
<b>Organisational set-up</b>	<p>The work will be carried out by volunteer organisations in the Member States, coordinated by the JRC.</p> <p>Communication and discussions will take place online. If needed, one face-to-face meeting can be organised to discuss feedback and resolve comments on the draft guidelines.</p>
<b>Lead</b>	JRC
<b>Scope</b>	This action will only address the use of the OGC API – Features as an INSPIRE Download service. The encoding of the data is out of scope. In addition, executable test suites will be developed outside the scope of the action.
<b>Tasks</b>	<ol style="list-style-type: none"> <li>1) Review the existing guideline for “Setting up an INSPIRE Download service based on the OGC API-Features standard”</li> <li>2) Test the proposed approach for setting up INSPIRE Download services through deployment of OGC API – Features instances with volunteer MS data providers. Different open source and proprietary implementations of the OGC API – Features should ideally be covered.</li> <li>3) Summarise the lessons learnt on GitHub, and propose revisions of the draft guideline.</li> <li>4) Organise a webinar/meeting for discussing the lessons learnt and potential issues or improvement proposal.</li> <li>5) Draft and submit for endorsement an INSPIRE good practice fiche.</li> <li>6) Identify and document issues for (i) a possible update of the INSPIRE NS Regulation, and (ii) the technological evolution of INSPIRE in general.</li> </ol>
<b>Outcomes</b>	<ul style="list-style-type: none"> <li>• Updated guidance document</li> <li>• Webinar recordings</li> <li>• Proposal for an INSPIRE good practice</li> <li>• Possible suggestions for update of the INSPIRE NS Regulation</li> </ul>
<b>Proposed Impact</b>	<input type="checkbox"/> Technical Adjustment / Bug Fixing <input checked="" type="checkbox"/> Technical Improvement / Development

Title	INSPIRE Download Services based on the OGC API – Features standard	
	<input checked="" type="checkbox"/> Practical Support for Implementing Process <input checked="" type="checkbox"/> Cost Reducing Effect for Implementing Process <input type="checkbox"/> Direct Support on Policy-Making / - Activities	
<b>Timeline</b>	Date of kick-off: March 2020	
	Proposed Date of Completion: November 2020	
<b>Required human resources and expertise</b>	The participants should have expertise in one or several of the following areas: <ul style="list-style-type: none"> <li>• General knowledge of Web APIs and the OpenAPI standard</li> <li>• OGC Standards for access to geospatial data</li> <li>• Open source and proprietary software implementations of OGC Standards and client applications</li> <li>• Implementing Rules and existing Technical Guidelines for INSPIRE Download services</li> </ul>	
<b>Required financial resources</b>	<ul style="list-style-type: none"> <li>• Meeting reimbursement (where applicable) In-kind contribution from participating organisations</li> </ul>	
<b>Risk factors</b>	Overall risk level of the action <ul style="list-style-type: none"> <li><input type="checkbox"/> High</li> <li><input checked="" type="checkbox"/> Medium</li> <li><input type="checkbox"/> Low</li> </ul>	Risk factors to be considered <ul style="list-style-type: none"> <li><input type="checkbox"/> Missing Resources</li> <li><input checked="" type="checkbox"/> High Complexity</li> <li><input type="checkbox"/> Interdependencies with other Actions</li> </ul>
	<b>Possible funding</b>	<ul style="list-style-type: none"> <li>• DG ENV funding (through Administrative Arrangement)</li> <li>• MS funding / in-kind contributions</li> </ul>