W3C/OGC Spatial Data on the Web

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MIG-T f2f Meeting

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W3C and OGC to Collaborate to Integrate Spatial Data on the Web

6 January 2015 — The W3C and the Open Geospatial Consortium (OGC) announced today a new collaboration to improve interoperability and integration of spatial data on the Web. Spatial data—describing geographic locations on the earth and natural and constructed features—enriches location-based consumer services, online maps, journalism, scientific research, government administration, the Internet of Things, and many other applications. In the United States alone, geospatial data and services are estimated to generate $1.6 trillion annually.

"Location, as well as providing context to much of today’s online information, is vital to the emerging field of connected devices," said Ed Parsons, Geospatial Technologist at Google. "Through this collaboration we hope to make the understanding of geospatial knowledge a fundamental component of the Web."
SDW Deliverables: UCRs & BPs

- **Use Cases and Requirements** *(Note)*
  A document setting out the range of problems that the working groups are trying to solve.

- **Spatial Data on the Web Best Practices** *(Note)*
  This will include:
  - an agreed spatial ontology conformant to the ISO 19107 abstract model and based on existing available ontologies such as **GeoSPARQL**, **NeoGeo** and the **ISA Core Location** vocabulary\(^{\text{OGC, W3C}}\);
  - advice on use of URIs as identifiers in GI systems\(^{\text{W3C}}\);
  - advice on providing different levels of metadata for different usage scenarios (from broad sweep metadata to metadata about individual coordinates in a polygon)\(^{\text{OGC}}\);
  - develop advice on, or possibly define, RESTful APIs to return data in a variety of formats including those defined elsewhere, such as **GeoJSON**, **GeoJSON-LD** and **TopoJSON**\(^{\text{OGC, W3C}}\).
**SDW Deliverables: Ontologies**

- **Time Ontology in OWL** *(Recommendation)*[^W3C, OGC]

  The WG will work with the authors of the existing [Time Ontology in OWL](https://www.w3.org/2006/time/ontology) to complete the development of this widely used ontology through to Recommendation status. Further requirements already identified in the geospatial community will be taken into account.

- **Semantic Sensor Network Vocabulary** *(Recommendation)*[^OGC, W3C]

  The WG will work with the members of the former [Semantic Sensor Network Incubator Group](http://www.ogc.org/insight/20120510/20120510-ssn-ogc-2012) to develop its ontology into a formal Recommendation, noting the [work to split the ontology into smaller sections](http://www.ogc.org/insight/20120510/20120510-ssn-ogc-2012) to offer simplified access.

- **Coverage in Linked Data** *(Recommendation)*[^OGC]

  The WG will develop a formal Recommendation for expressing discrete coverage data conformant to the [ISO 19123](https://www.iso.org/standard/41916.html) abstract model. Existing standard and *de facto* ontologies will be examined for applicability; these will include the [RDF Data Cube](http://www.openlinksw.com/) and OGC's [WaterML](http://www.opengeospatial.org/standards/wml) 2 Part 1 - Timeseries will be used as an initial basis.

  Given that coverage data can often be extremely large in size, publication of the individual data points as Linked Data may not always be appropriate. The Recommendation will include provision for describing an entire coverage dataset and subsets thereof published in more compact formats using Linked Data. For example where a third party wishes to annotate a subset of a large coverage dataset or a data provider wishes to publish a large coverage dataset in smaller subsets to support convenient reuse.
The **ISA Core Location vocabulary** is mentioned as one of the reference ontologies.

**Spatial Data on the Web Best Practices (Note)**

This will include:

- an agreed spatial ontology conformant to the ISO 19107 abstract model and based on existing available ontologies such as GeoSPARQL, NeoGeo and the **ISA Core Location vocabulary**.
- advice on use of URIs as identifiers in GI systems.
- advice on providing different levels of metadata for different usage scenarios (from broad sweep metadata to metadata about individual coordinates in a polygon).
- develop advice on, or possibly define, RESTful APIs to return data in a variety of formats including those defined elsewhere, such as GeoJSON, GeoJSON-LD and TopoJSON.

**4.4 Other Groups & Projects**

**INSPIRE**

The community and standards around the European INSPIRE Directive are an important reference point for the Working Group.

**SmartOpenData, GeoKnow, MELODIES, DaPaas, InGeoCloudS**

A range of EU-funded projects are working in closely related areas, the list above is not exhaustive.

**stSPARQL**

The Strabon platform implements stSPARQL that offer a number of spatial and temporal extension functions.

**INSPIRE** is explicitly mentioned as a reference initiative.
**SDW Roadmap (as per the WG Charter)**

### Milestones

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<th>Deliverable</th>
<th>FPWD</th>
<th>LC</th>
<th>CR</th>
<th>PR</th>
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<tr>
<td>Use Cases and Requirements</td>
<td>March 2014</td>
<td>June 2015</td>
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*Note: The group will document significant changes from this initial schedule on the group home page.*

**New roadmap:** *Deadline to be extended (June, 2017)*
SDW Best Practices

- Editors: Jeremy Tandy (MetOffice), Linda van den Brink (Geonovum), Payam Barnaghi (University of Surrey)

- Focus is on how to enable the (re)use of spatial data via the Web platform
  - The focus is on Web technologies, and not necessarily on the Semantic Web (e.g., RDF)

- BPs build upon and re-use the W3C Data on the Web Best Practices, which are addressing the same objective from a domain-independent perspective


- Presented at the SDW Workshop @ INSPIRE 2016
12. **Best Practices Summary**

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<th>Best Practice 1</th>
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<tr>
<td>Include spatial metadata in dataset metadata</td>
<td>Use spatial semantics for Spatial Things</td>
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<td>Best Practice 2</td>
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<td>Provide context required to interpret data values</td>
<td>Expose spatial data through 'convenience APIs'</td>
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<td>Best Practice 3</td>
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<tr>
<td>Specify Coordinate Reference System for high-precision applications</td>
<td>Include search capability in your data access API</td>
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<td>Best Practice 4</td>
<td>Best Practice 13</td>
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<td>Make your data indexable by search engines</td>
<td>Provide subsets for large spatial datasets</td>
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<td>Best Practice 5</td>
<td>Best Practice 14</td>
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<td>Describe the positional accuracy of spatial data</td>
<td>Publish links to related resources</td>
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<td>Best Practice 6</td>
<td>Best Practice 15</td>
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<td>How to describe properties that change over time</td>
<td>Use links to find related data</td>
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<td>Best Practice 7</td>
<td>Best Practice 16</td>
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<td>Use globally unique HTTP identifiers for spatial things</td>
<td>Provide a minimum set of information for your intended application</td>
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<td>Best Practice 8</td>
<td>Best Practice 17</td>
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<td>Provide geometries on the Web in a usable way</td>
<td>How to work with crowd-sourced observations</td>
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<td>Best Practice 9</td>
<td>Best Practice 18</td>
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<tr>
<td>How to describe relative positions</td>
<td>Describe the location according to a Coordinate Reference System</td>
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SDW Workshop @ INSPIRE 2016

- Held on Sep, 30th, and attended by ~30 people
- Best Practices discussed during the workshop:
  - **BP7**: Use globally unique HTTP identifiers for spatial things
  - **BP4**: Make your data indexable by search engines
  - **BP8**: Provide geometries on the Web in a usable way
  - **BP10**: Use spatial semantics for Spatial Things
- Positive outcome in terms of discussion and feedback
- The feedback will be considered in the new versions of the BP document (to be released on a regular basis until June, 2017)

- Comments can be sent to: public-sdw-comments@w3.org
Thanks for your attention!

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For more information

- W3C/OGC SDW Charter
  https://www.w3.org/2015/spatial/charter

- W3C/OGC SDW work space
  https://www.w3.org/2015/spatial/

- SDW Workshop @ INSPIRE 2016
  https://www.w3.org/2015/spatial/wiki/SDW_Workshop @$_INSPIRE$_2016

- Spatial Data on the Web Use Cases & Requirements
  https://www.w3.org/TR/sdw-ucr/

- Spatial Data on the Web Best Practices
  https://www.w3.org/TR/sdw-bp/

- Index of all deliverables
  http://w3c.github.io/sdw/