

Esri® Supported Open Geospatial Consortium, Inc.®, and ISO/TC 211 Standards



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An Esri White Paper

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Esri Supported Open Geospatial Consortium, Inc., and ISO/TC 211 Standards

Esri's approach to interoperability encompasses the International Organization for Standardization Technical Committee 211 (ISO/TC 211) and Open Geospatial Consortium, Inc.[®] (OGC[®]), specifications and standards.

Additionally, Esri[®] software engineering is guided by specifications from the IT and web services communities such as the World Wide Web Consortium and Organization for the Advancement of Structured Information Standards as well as standards from the ANSI/International Committee for Information Technology Standards and Comité Européen de Normalisation (European Committee for Normalization).

This document provides a list of all OGC specifications and ISO/TC 211 geographic information standards supported by Esri. This list is current as of the date of this document. For the latest information, visit esri.com/standards.

Supported OGC Specifications

OGC Interoperability

Specification	Provider	Consumer
Web Mapping Service (WMS) 1.1.1	ArcIMS® 9.2, 9.3, 10 ArcGIS® Server 9.2, 9.3, 10	GIS Portal Toolkit 3.1, 9.3 ArcGIS Desktop 9.2, 9.3, 10 ArcGIS Explorer ArcGlobe™ 9.2, 9.3, 10 ArcGIS .NET and Java™ ADF, Versions 9.2, 9.3, 10 Esri Geoportals Server, Versions 9.3.1, 10
Web Mapping Service 1.3	ArcIMS 9.2, 9.3, 10 ArcGIS Server 9.2, 9.3, 10	GIS Portal Toolkit 3.1, 9.3 ArcGIS Desktop 9.2, 9.3, 10 ArcGIS .NET and Java ADF, Versions 9.2, 9.3, 10 Esri Geoportals Server, Versions 9.3.1, 10
Styled Layer Descriptor (SLD) 1.0	ArcIMS 9.2, 9.3, 10 ArcGIS Server 9.3, 10	GIS Portal Toolkit 3.1, 9.3 ArcGIS Desktop 9.3, 10
Web Feature Service (WFS) 1.0	ArcIMS 9.2, 9.3, 10 ArcGIS Server 9.3, 10	ArcGIS Desktop 9.2, 9.3, 9.3.1, 10 ArcGIS Data Interoperability 9.2, 9.3, 9.3.1, 10 GIS Portal Toolkit 9.3 Esri Geoportals Server, Versions 9.3.1, 10
Web Feature Service 1.1	ArcIMS 9.3, 10 ArcGIS Server 9.3, 10	ArcGIS Desktop 9.3, 10 ArcGIS Data Interoperability 9.3, 10 GIS Portal Toolkit 3.1, 9.3 Esri Geoportals Server, Versions 9.3.1, 10
Web Feature Service 1.1 (Transactions)	ArcGIS Server 9.3, 10	Open Layers Based Client Tool

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Filter Encoding 1.0	ArcIMS 9.2, 9.3, 10	ArcGIS Desktop 9.2, 9.3, 10 ArcGIS Data Interoperability 9.2, 9.3, 10 GIS Portal Toolkit 3.1, 9.3 Esri Geoportal Server, Versions 9.3.1, 10
Filter Encoding 1.1	ArcGIS Server 9.3, 10	ArcGIS Desktop 9.3, 10 ArcGIS Data Interoperability 9.3, 10 GIS Portal Toolkit 3.1, 9.3 Esri Geoportal Server, Versions 9.3.1, 10
Web Coverage Service (WCS) 1.0	ArcGIS Server 9.3 WCS capability available with/without Image Server extension ArcGIS Server 10 WCS capability available with/without Image Server extension	GIS Portal Toolkit 3.1, 9.3 ArcGIS Desktop 9.3, 10 Esri Geoportal Server, Versions 9.3.1, 10
Web Coverage Service 1.1, 1.1.1	ArcGIS Server 9.3, 10 WCS capability available with/without Image Server extension	GIS Portal Toolkit 3.1, 9.3 ArcGIS Desktop 9.3, 10 Esri Geoportal Server, Versions 9.3.1, 10
Catalog Services 1.0—Z39.50	ArcIMS 9.2, 9.3, 10 GIS Portal Toolkit 3.1, 9.3 Esri Geoportal Server, Versions 9.3.1, 10	GIS Portal Toolkit 3.1, 9.3 Esri Geoportal Server, Versions 9.3.1, 10
Web Catalog Service (CSW) 2.0.1	ArcIMS 9.2, 9.3, 10 GIS Portal Toolkit 3.1, 9.3	GIS Portal Toolkit 3.1, 9.3 GIS Portal Toolbar for ArcGIS 9.3 CSW Client for ArcGIS, Versions 9.3.1, 10 Esri Geoportal Server, Versions 9.3.1, 10

Web Catalog Service (CSW) 2.0.2	ArcIMS 9.3, 10 GIS Portal Toolkit 3.1, 9.3 Esri Geoportal Server, Versions 9.3.1, 10	GIS Portal Toolkit 3.1, 9.3 GIS Portal Toolbar for ArcGIS 9.3 CSW Client for ArcGIS 9.3.1, 10
Simple Features (SF) 1.1	ArcSDE® ArcGIS	ArcGIS
Geography Markup Language (GML) 2.x	ArcIMS 9.3 WFS Connector ArcIMS 10 WFS Connector	ArcGIS Data Interoperability 9.3 ArcGIS Data Interoperability 10
Geography Markup Language 3.1.x	ArcGIS Data Interoperability 9.2, 9.3, 10	ArcGIS Data Interoperability 9.2, 9.3, 10
Simple Features GML	ArcGIS Desktop 9.2, 9.3, 10 ArcGIS Data Interoperability 9.2, 9.3, 10 ArcGIS Server 9.3, 10	ArcGIS Desktop 9.2, 9.3, 10 ArcGIS Data Interoperability 9.2, 9.3, 10 ArcGIS Desktop 9.3
KML Version 2.1	ArcGIS Server 9.2, 9.3, 10 ArcGIS Desktop 9.3, 10	ArcGIS Explorer ArcGlobe 9.2, 9.3, 10 ArcGIS Data Interoperability Extension 9.3, 10
OGC KML Version 2.2	ArcGIS Server 9.3, 10 ArcGIS Desktop 9.3, 10 GIS Portal Toolkit 9.3 Esri Geoportal Server, Versions 9.3.1, 10	ArcGIS Explorer ArcGlobe 9.2, 9.3, 10 ArcGIS Data Interoperability Extension 9.3, 10

All product versions mentioned in the table above refer to the most recent product versions where the standard/specification is supported. Earlier versions of the products have also supported many of these specifications.

OGC Certifications

Specification	Test Available?	Status
Web Mapping Service 1.1.1	Yes	OGC-certified compliant for ArcIMS, ArcGIS Server
Web Mapping Service 1.3	Yes	OGC-certified compliant for ArcGIS Server
Styled Layer Descriptor 1.0	No	Not applicable
Web Feature Service 1.0	Yes	OGC-certified compliant for ArcIMS, ArcGIS Server
Web Coverage Service 1.0	Yes	OGC-certified compliant for ArcGIS Server
Catalog Service—Web 2.0.2	Yes	OGC-certified compliant for ArcGIS Server (Geoportal Extension)
Geography Markup Language 3.0	No	Not applicable
Simple Features 1.1—SQL Types	Yes	OGC-certified compliant for ArcSDE 9.1 (DB2 [®] , Informix [®]), ArcGIS Server 9.2, 9.3, 10 (DB2, Informix, Oracle [®])
Simple Features 1.1—Binary Geometry Alternative	Yes	OGC-certified compliant for ArcSDE (SQL Server, Oracle), ArcGIS Server 9.2, 9.3, 10 (DB2, SQL Server Express)
Simple Features 1.1—OLE/COM	Yes	OGC-certified compliant for ArcGIS

For up-to-date information on OGC-compliant Esri products, visit the OGC website at <http://www.opengeospatial.org/resource/products/#ESRI>.

Supported ISO/TC 211 International Standards	ISO/TC 211 Geographic Information Standards	Esri's Implementation
	ISO 19106:2004—Profiles	Esri has used the concepts in this standard to produce user-community profiles of metadata and the Simple Features GML.
	ISO 19107:2003—Spatial Schema	Esri has used the concepts in this standard in the development of ISO 19125 and ISO 19115; basic concepts defined in this standard are implemented in ArcGIS and in the design of geodatabases. This is the foundation for Simple Features GML.
	ISO 19108:2003—Temporal Schema	Esri has implemented the concepts in this standard in metadata and handling time-aware data in ArcGIS.
	ISO 19109:2005—Rules for Application Schema	Using the concepts described in this standard, Esri defines application schemas using a conceptual schema language (e.g., UML). The ArcGIS Data Interoperability extension applies the concepts of mapping from one application schema to another for data transfer as defined in the standard. Esri also uses the same concepts as the general feature model (GFM) as defined in the standard.
	ISO 19110:2005—Methodology for Feature Cataloging	Esri is participating in several standards organizations to develop an encoding for feature catalogs based on the concepts in this standard. Encoded catalogs can be used as additional metadata. Esri is also participating in the development of a North American Profile of ISO 19110.
	ISO 19111:2003—Spatial Referencing by Coordinates	Esri implements the basic concepts defined in this standard through GML and in coordinate reference system libraries in ArcGIS.
	ISO 19112:2003—Spatial Referencing by Geographic Identifiers	Esri uses the concepts defined in this standard in the implementation of gazetteers as well as wherever spatial referencing by geographic identifiers is used.
	ISO 19113:2002—Quality Principles; ISO 19114:2003—Quality Evaluation Procedures	Esri implements the concepts in these standards in its mapping and charting solution products and database production services.
	ISO 19115:2003—Metadata	Esri implements this standard with Esri Geoportal Server and in ArcGIS Desktop. Esri products implement several major profiles of this standard: North American Profile, Infrastructure for Spatial Information in Europe (INSPIRE), and the complete ISO 19115. Esri played a lead role in supporting the development of this standard and is leading the new revision project.

ISO 19118:2005— Encoding	Esri used the concepts defined in this standard while leading the development of SF-GML and ISO 19139.
ISO 19119:2005—Services	Esri is using the concepts defined in this standard in its implementation of the OGC W*S specifications.
ISO 19123:2005—Schema for Coverage Geometry	Esri uses the concepts defined in this standard for exchanging and interfacing with several raster, matrix, and TIN structures.
ISO 19125:2004—Simple Feature Access—Parts 1–2	Esri implements this standard with ArcSDE technology and ArcGIS Desktop. Esri played a lead role in supporting the development of this standard.
ISO 19128:2005—Web Map Server Interface	Esri supports this standard in both its server and client implementations. From an implementation perspective, this is equivalent to the OGC WMS 1.3 specification.
ISO 19136:2007— Geography Markup Language	Esri implements this standard in ArcGIS and in using the Data Interoperability extension. This is equivalent to OGC GML 3.2.1.
ISO 19139:2007— Metadata: XML Schema Implementation	Esri implements this standard with Esri Geoportal Server, and ArcGIS Desktop supports the import, export, and validation of metadata according to this standard.

In addition, Esri is participating in the review, development, and/or test implementation of many of the Draft ISO Standards (DIS) and Final Draft ISO Standards (FDIS) being finalized in ISO/TC 211. These include

- ISO 19117 Revision—Portrayal
- ISO 19146—Cross-Domain Vocabularies
- ISO 19157—Data Quality

Extensibility and Customization

Many specifications and standards are written to provide exhaustive support for various entities that a wide variety of domains can borrow and build on. Various interest groups therefore tend to use these specifications as overall guidance to define profiles and application schemas that are relevant to their domain. Similarly, some specifications provide an underlying framework that is information model agnostic; the catalog specification (OGC CSW) can be implemented to support multiple information models—ISO, eb-RIM, and so forth.

ArcGIS not only supports many of these profiles, application schemas, and information models out of the box but also provides convenient tools for extending and customizing the existing functionality to accommodate and work with these newly emerging schemas and information models.

Here are some examples:

■ Data Interoperability

- The Data Interoperability extension also supports additional GML application schemas such as OS MasterMap and Top10NL. Additionally, the Data Interoperability extension provides a customization environment to support other emerging GML application schemas.
- The Data Interoperability Extension allows users to convert/transform data to/from many different formats. The extension also supports a workbench environment for users to define custom formats.

■ OGC Web Catalog Service and Metadata

- CSW implementations support both the ISO and eb-RIM information models.
- The CSW provider (part of the metadata server) can be extended to support additional queryables, returnables, and profiles.
- Esri's CSW client can be extended by users to support other CSW interfaces as they become available.
- ArcGIS metadata editors may be extended to support specific profiles.

**For More
Information**

For the most up-to-date list, visit esri.com/standards. Additional information regarding interoperability in ArcGIS and Esri's strategy for supporting interoperable enterprise geographic information system (GIS) technology is outlined in the *ArcGIS: Engineered for Interoperability* and *Interoperability in Enterprise GIS* white papers available at esri.com/standards.



About Esri

Since 1969, Esri has been helping organizations map and model our world. Esri's GIS software tools and methodologies enable these organizations to effectively analyze and manage their geographic information and make better decisions. They are supported by our experienced and knowledgeable staff and extensive network of business partners and international distributors.

A full-service GIS company, Esri supports the implementation of GIS technology on desktops, servers, online services, and mobile devices. These GIS solutions are flexible, customizable, and easy to use.

Our Focus

Esri software is used by hundreds of thousands of organizations that apply GIS to solve problems and make our world a better place to live. We pay close attention to our users to ensure they have the best tools possible to accomplish their missions. A comprehensive suite of training options offered worldwide helps our users fully leverage their GIS applications.

Esri is a socially conscious business, actively supporting organizations involved in education, conservation, sustainable development, and humanitarian affairs.

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