



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

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

An ESRI White Paper

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

ESRI's approach to interoperability fully 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 www.esri.com/standards.

Supported OGC Specifications

OGC Interoperability

Specification	Provider	Consumer
Web Mapping Service (WMS) 1.1.1	<ul style="list-style-type: none"> • ArcIMS® 9.2 • ArcGIS® Server 9.2 • ArcIMS 9.3 • ArcGIS Server 9.3 	<ul style="list-style-type: none"> • GIS Portal Toolkit 3.1 • ArcGIS Desktop 9.2 • ArcGIS Desktop 9.3 • ArcGIS Explorer • ArcGlobe™ 9.2 • ArcGIS 9.2 .NET and Java™ Application Developer Framework (ADF™) • ArcGlobe 9.3 • ArcGIS 9.3 .NET and Java ADF
Web Mapping Service 1.3	<ul style="list-style-type: none"> • ArcIMS 9.2 • ArcGIS Server 9.2 • ArcIMS 9.3 • ArcGIS Server 9.3 	<ul style="list-style-type: none"> • GIS Portal Toolkit 3.1 • ArcGIS Desktop 9.2 • ArcGIS 9.2 .NET and Java ADF • ArcGIS Desktop 9.3 • ArcGIS 9.3 .NET and Java ADF
Styled Layer Descriptor (SLD) 1.0	<ul style="list-style-type: none"> • ArcIMS 9.2 • ArcIMS 9.3 • ArcGIS Server 9.3 	<ul style="list-style-type: none"> • GIS Portal Toolkit 3.1 • ArcGIS Desktop 9.3
Web Feature Service (WFS) 1.0	<ul style="list-style-type: none"> • ArcIMS 9.2 • ArcIMS 9.3 	<ul style="list-style-type: none"> • ArcGIS Desktop 9.2 • ArcGIS Data Interoperability 9.2 • ArcGIS Desktop 9.3 • ArcGIS Data Interoperability 9.3
Web Feature Service 1.1	<ul style="list-style-type: none"> • ArcIMS 9.3 • ArcGIS Server 9.3 	<ul style="list-style-type: none"> • ArcGIS Desktop 9.3 • ArcGIS Data Interoperability 9.3 • GIS Portal Toolkit 3.1
Web Feature Service 1.1 (Transactions)	<ul style="list-style-type: none"> • ArcGIS Server 9.3 	
Filter Encoding 1.0	<ul style="list-style-type: none"> • ArcIMS 9.2 • ArcIMS 9.3 	<ul style="list-style-type: none"> • ArcGIS Desktop 9.2 • ArcGIS Data Interoperability 9.2

Specification	Provider	Consumer
		<ul style="list-style-type: none"> • ArcGIS Desktop 9.3 • ArcGIS Data Interoperability 9.3 • GIS Portal Toolkit 3.1
Filter Encoding 1.1	<ul style="list-style-type: none"> • ArcGIS Server 9.3 	<ul style="list-style-type: none"> • ArcGIS Desktop 9.3 • ArcGIS Data Interoperability 9.3 • GIS Portal Toolkit 3.1
Web Coverage Service (WCS) 1.0	<ul style="list-style-type: none"> • ArcGIS Server 9.3 <p>WCS capability available with/without Image Server extension</p>	<ul style="list-style-type: none"> • GIS Portal Toolkit 3.1 • ArcGIS Desktop 9.3
Web Coverage Service 1.1, 1.1.1	<ul style="list-style-type: none"> • ArcGIS Server 9.3 <p>WCS capability available with/without Image Server extension</p>	<ul style="list-style-type: none"> • GIS Portal Toolkit 3.1 • ArcGIS Desktop 9.3
Catalog Services 1.0—Z39.50	<ul style="list-style-type: none"> • ArcIMS 9.2 • ArcIMS 9.3 • GIS Portal Toolkit 3.1 	<ul style="list-style-type: none"> • GIS Portal Toolkit 3.1
Web Catalog Service (CS-W) 2.0.1	<ul style="list-style-type: none"> • ArcIMS 9.2 • ArcIMS 9.3 • GIS Portal Toolkit 3.1 	<ul style="list-style-type: none"> • GIS Portal Toolkit 3.1 • GIS Portal Toolbar for ArcGIS 9.3
Web Catalog Service 2.0.2	<ul style="list-style-type: none"> • ArcIMS 9.3 • GIS Portal Toolkit 3.1 	<ul style="list-style-type: none"> • GIS Portal Toolkit 3.1 • GIS Portal Toolbar for ArcGIS 9.3
Simple Features 1.1	<ul style="list-style-type: none"> • ArcSDE® • ArcGIS 	<ul style="list-style-type: none"> • ArcGIS
Geography Markup Language (GML) 2.x	<ul style="list-style-type: none"> • ArcIMS 9.3 WFS Connector 	<ul style="list-style-type: none"> • ArcGIS Data Interoperability 9.3
Geography Markup Language 3.1.x	<ul style="list-style-type: none"> • ArcGIS Data Interoperability 9.2 • ArcGIS Data Interoperability 9.3 	<ul style="list-style-type: none"> • ArcGIS Data Interoperability 9.2 • ArcGIS Data Interoperability 9.3
Simple Features GML	<ul style="list-style-type: none"> • ArcGIS Desktop 9.2 • ArcGIS Data Interoperability 9.2 • ArcGIS Desktop 9.3 	<ul style="list-style-type: none"> • ArcGIS Desktop 9.2 • ArcGIS Data Interoperability 9.2 • ArcGIS Desktop 9.3

Specification	Provider	Consumer
	<ul style="list-style-type: none"> ArcGIS Data Interoperability 9.3 ArcGIS Server 9.3 	<ul style="list-style-type: none"> ArcGIS Data Interoperability 9.3
KML Version 2.1	<ul style="list-style-type: none"> ArcGIS Server 9.2 ArcGIS Server 9.3 ArcGIS Desktop 9.3 	<ul style="list-style-type: none"> ArcGIS Explorer ArcGlobe 9.2 ArcGlobe 9.3
OGC KML Version 2.2	<ul style="list-style-type: none"> ArcGIS Server 9.3 ArcGIS Desktop 9.3 	<ul style="list-style-type: none"> ArcGIS Explorer ArcGlobe 9.2 ArcGlobe 9.3

All product versions mentioned in the table above refer to recent product versions (9.2 and later) where the standard/specification is supported. Earlier versions of the products have also supported many of these specifications. For details on those, please refer to previous versions of this document ([ESRI-Supported ISO and Open Geospatial Consortium, Inc., Standards](#), white paper, June 2007).

OGC Certifications

Specification	Test Available?	Status
Web Mapping Service 1.1.1	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
Web Coverage Service 1.0	Yes	Not certified
Web Catalog Service 2.1	Yes	Not certified
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 (DB2, Informix, Oracle [®])
Simple Features 1.1—Binary Geometry Alternative	Yes	OGC-certified compliant for ArcSDE (SQL Server [™] , Oracle), ArcGIS Server 9.2 (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 Web site at <http://www.opengeospatial.org>.

Supported ISO/TC 211 International Standards	ISO/TC 211 Geographic Information Standards	ESRI's Implementation
	ISO 19106:2004—Profiles	ESRI is using the concepts in this standard to produce user-community profiles of metadata and the Simple Features (SF) GML.
	ISO 19107:2003—Spatial Schema	ESRI is using 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 19128:2005—Web Map Server Interface	ESRI supports this standard in both its server and client implementation. From an implementation perspective, this is equivalent to the OGC WMS 1.3 specification.
	ISO 19136:2007—Geography Markup Language	ESRI implements this specification. The GML functionality as specified in this standard is primarily available using the Data Interoperability extension to ArcGIS.
	ISO 19108:2003—Temporal Schema	ESRI implements the concepts in this standard in metadata and wherever temporal information is appropriate.
	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.
	ISO 19111:2003—Spatial Referencing by Coordinates	ESRI implements the basic concepts defined in this standard through GML and participates on the project team for the development of the new amendment for this standard.
	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;	ESRI implements the concepts in these standards in Production Line Tool Set (PLTS™) for ArcGIS and in database production services.
	ISO 19114:2003—Quality Evaluation Procedures	

ISO/TC 211 Geographic Information Standards**ESRI's Implementation**

ISO 19115:2003—Metadata

ESRI implements this standard with ArcIMS Metadata Services 9.1 and GIS Portal Toolkit 2 and in ArcGIS Desktop. ESRI played a lead role in supporting the development of this standard.

ISO 19139:2007—
Metadata: XML Schema
Implementation

ISO 19139 is designed to provide a common XML specification for describing, validating, and exchanging geographic metadata. It is intended to promote interoperability and exploit ISO 19115's advantages in a concrete implementation specification. ESRI implements this standard with ArcIMS Metadata Services 9.2 and GIS Portal Toolkit and in ArcGIS Desktop 9.2.

ISO 19118:2005—
Encoding

ESRI is using the concepts defined in this standard in 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 and is testing implementation of their use in developing OGC profiles for Web Catalog Service.

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.

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 19137—Core profile of the spatial schema
- ISO 19138—Data quality measures
- ISO 19142—Web Feature Service
- ISO 19143—Filter encoding

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 CS-W) 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
 - CS-W implementations support both the ISO and eb-RIM information models.
 - The CS-W provider (part of the metadata server) can be extended to support additional queryables, returnables, and profiles.
 - ESRI's CS-W client can be extended by users to support other CS-W 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 www.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 www.esri.com/standards.



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For More Information

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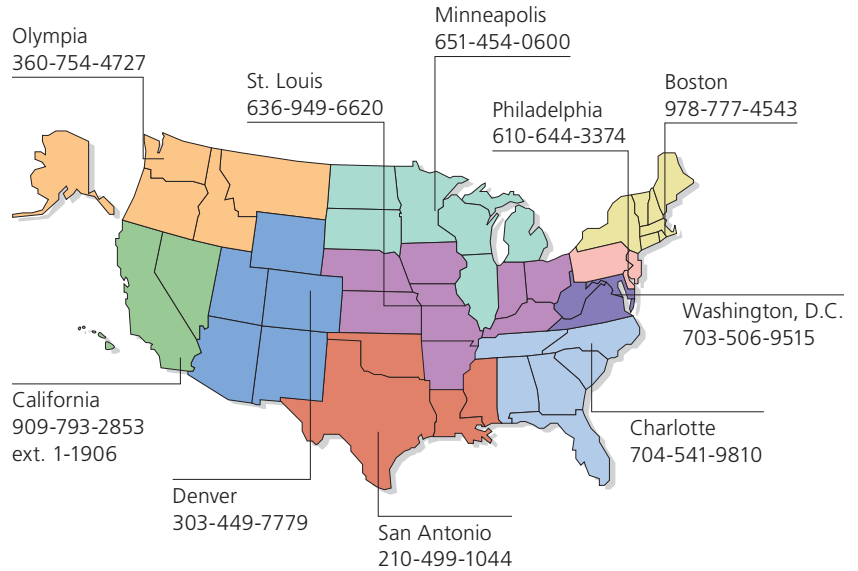
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