ArcGIS Is Open and Interoperable

Esri Support for Geospatial Standards
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Executive Summary

At Esri, we believe in the power of The Science of Where™. Applied geography helps people better understand our world. Our work is the science of geographic information system (GIS) technology. We built and are constantly improving the geographic information system called the ArcGIS® platform.

People all over the world and across every field use ArcGIS to integrate and unify data to make better decisions and empower people to see and share information holistically. ArcGIS users have created countless essential GIS applications across hundreds of thousands of organizations. For over 40 years, Esri has focused on interoperability as a basic design principle of our products.

How Esri Keeps ArcGIS Open and Interoperable

The ArcGIS platform is engineered to be open and interoperable. To create an open system, Esri has adopted a multifaceted approach, which includes the following:

- Leveraging Standards—IT and GIS standards
- Open Architecture—Open APIs
- Engaging Communities—Sharing applications and experiences

“ArcGIS is an open platform. At Esri, we take that seriously because it means your data and systems are interoperable with other technologies. ArcGIS serves as an integral part of every organization. At its center is Web GIS, a way to open GIS access and benefits to everyone while creating connections within and across organizations.”—Jack Dangermond, Founder and CEO, Esri

ArcGIS also supports the following:

- Direct read/write of a wide variety of data formats
- Adoption and use of web and cloud standards and patterns
- Extract, Transform, and Load (ETL) technology
- Hardware platform choices
- Database choices
- Operating environment choices
- Cloud choices
- Developer tool choices
- Support for multiple coordinate, address and temporal reference systems
- Support for thousands of datums and projections

Support for OGC

Esri is a Principle Member of the Open Geospatial Consortium, Inc. (OGC), and active in its various programs. These include OGC standards development and testing, outreach and regional activities around the globe, test beds and interoperability experiments, and various OGC committees such as Planning Committee and Joint Advisory Group with ISO/TC 211. Esri also has a staff member on the board of directors.
Central to Esri support is our implementations of OGC standards in the ArcGIS platform.

The following listing of OGC standards supported in the ArcGIS platform is in two parts:

- List of Esri's OGC-compliant products: OGC compliancy means Esri has had our software tested by OGC to show compliance to a given standard. Not all OGC standards have compliance tests, and Esri implements many OGC standards for which there are no tests yet.

- List of Esri products implementing OGC standards: These products are not included in the OGC compliance listing.

Please note the Esri product naming convention: OGC-compliant products are listed here by the names they were called at the time of testing. Esri has gone through a naming convention change for the ArcGIS platform products around the time of the 10.0 release. This was done to reflect the unified nature of the Esri family of products.

For the most up-to-date list of Esri's support for OGC standards, please visit the OGC website at http://www.opengeospatial.org/resources/products.

Web Coverage Service (WCS) 2.0 Interface Standard-Core (Corrigendum) 2.0.1
- ArcGIS Enterprise 10.5
- ArcGIS 10.4 for Server

WCS Implementation Specification (Corrigendum) 1.1.1
- ArcGIS Enterprise 10.5
- ArcGIS 10.4 for Server
- ArcGIS 10.3 for Server
- ArcGIS 10.2 for Server

WCS Implementation Specification (Corrigendum) 1.0.0
- ArcGIS Enterprise 10.5
- ArcGIS 10.4 for Server
- ArcGIS 10.3 for Server
- ArcGIS 10.2 for Server
- ArcGIS 10.1 for Server
- ArcGIS Server 10.0
- ArcGIS Server 9.3

Web Feature Service (WFS) 2.0 Interface Standard (also ISO 19142)
- ArcGIS Enterprise 10.5
WFS 1.0.0
- ArcGIS Enterprise 10.5
- ArcGIS 10.4 for Server
- ArcGIS 10.3 for Server
- ArcGIS 10.2 for Server
- ArcGIS 10.1 for Server
- ArcGIS Server 10.0
- ArcGIS Server 9.3.1
- ArcGIS Server 9.3 Service Pack 1
- ArcIMS® 9.3
- ArcIMS 9.2
- ArcIMS 9.1 SP1

Web Map Service (WMS) Implementation Specification 1.3.0
- ArcGIS Enterprise 10.5
- ArcGIS
- Pro 1.4
- ArcGIS Desktop (ArcMap™) 10.5
- ArcGIS 10.4 for Server
- ArcGIS 10.3 for Server
- ArcGIS 10.2 for Server
- ArcGIS 10.1 for Server
- ArcGIS Server 10.0
- ArcGIS Server 9.3.1
- ArcGIS Server 9.3
- ArcIMS 9.3

WMS Implementation Specification 1.1.1
- ArcGIS Enterprise 10.5
- ArcGIS 10.4 for Server
- ArcGIS 10.3 for Server
- ArcGIS 10.2 for Server
- ArcGIS 10.1 for Server
- ArcGIS Server 10.0
- ArcGIS Server 9.3
- ArcIMS 9.3
- ArcGIS Server 9.2
- ArcIMS 9.2
- ArcIMS 9.1
- ArcIMS 9.0

Catalogue Service Implementation Specification 2.0.2 (CAT 2.0.2)
- Esri Geoportal™ Server 1.2.5 (Official OGC Reference Implementation)
- Esri Geoportal Server 1.2.4
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- Esri Geoportal Server 1.2.2
- ArcGIS Server Geoportal extension 10.0
- ArcGIS Server Geoportal extension 9.3.1

GeoPackage (GeoPackage) Encoding Standard—with Corrigendum 1.0.1
- ArcGIS Pro 1.4
- ArcGIS Desktop 10.5 (ArcMap)
- ArcGIS 10.4.1 for Desktop (Early Implementer)

GeoPackage: Tiling 1.0
- ArcGIS 10.4.1 for Desktop (Early Implementer)

Keyhole Markup Language (KML) 2.2.0
- ArcGIS Enterprise 10.5
- ArcGIS 10.4 for Server

Information Specification for Geospatial Information—Simple Features Access 1.1 (SFS 1.1) (Core)
- ArcGIS Enterprise 10.5—SAP HANA
- ArcGIS Enterprise 10.5—DB2
- ArcGIS Enterprise 10.5—Informix
- ArcGIS Enterprise 10.5—SQL Server
- ArcGIS Enterprise 10.5—SQLite
- ArcGIS Enterprise 10.5—Netezza
- ArcGIS Enterprise 10.5—Oracle
- ArcGIS Enterprise 10.5—PostgreSQL
- ArcGIS Enterprise 10.5—Teradata
- ArcGIS Enterprise 10.5—Dameng
- ArcGIS 10.4 for Server—SAP HANA
- ArcGIS 10.4 for Server—DB2
- ArcGIS 10.4 for Server—Informix
- ArcGIS 10.4 for Server—SQL Server
- ArcGIS 10.4 for Server—SQLite
- ArcGIS 10.4 for Server—Netezza
- ArcGIS 10.4 for Server—Oracle
- ArcGIS 10.4 for Server—PostgreSQL
- ArcGIS 10.4 for Server—Teradata
- ArcGIS 10.3 for Server—Informix
- ArcGIS 10.3 for Server—DB2
- ArcGIS 10.3 for Server—SQL Server
- ArcGIS 10.3 for Server—SQLite
- ArcGIS 10.3 for Server—Netezza
- ArcGIS 10.3 for Server—Oracle
- ArcGIS 10.3 for Server—PostgreSQL
- ArcGIS 10.3 for Server—Teradata
- ArcGIS 10.2 for Server—Informix
- ArcGIS 10.2 for Server—DB2
- ArcGIS 10.2 for Server—SQL Server
- ArcGIS 10.2 for Server—SQLite
- ArcGIS 10.2 for Server—Netezza
- ArcGIS 10.2 for Server—Oracle
- ArcGIS 10.2 for Server—PostgreSQL
- ArcGIS 10.2 for Server—Teradata
- ArcGIS 10.1 for Server Enterprise (ArcSDE®)—DB2
- ArcGIS 10.1 for Server Enterprise (ArcSDE)—Informix
- ArcGIS 10.1 for Server Enterprise (ArcSDE)—Oracle
- ArcGIS 10.1 for Server Enterprise (ArcSDE)—PostgreSQL
- ArcGIS 10.1 for Server Enterprise (ArcSDE)—SQL Server
- ArcGIS Server Enterprise (ArcSDE) 10.0—DB
- ArcGIS Server Enterprise (ArcSDE) 10.0—Informix
- ArcGIS Server Enterprise (ArcSDE) 10.0—Oracle
- ArcGIS Server Enterprise (ArcSDE) 10.0—PostgreSQL
- ArcGIS Server Enterprise (ArcSDE) 10.0—SQL Server
- ArcGIS Server Enterprise (ArcSDE) 9.3.1—DB2
- ArcGIS Server Enterprise (ArcSDE) 9.3.1—Informix
- ArcGIS Server Enterprise (ArcSDE) 9.3.1—Oracle
- ArcGIS Server Enterprise (ArcSDE) 9.3.1—PostgreSQL
- ArcGIS Server Enterprise (ArcSDE) 9.3.1—SQL Server
- ArcGIS Server 9.3—DB2
- ArcSDE 9.3—Informix
- ArcSDE 9.3—Oracle
- ArcSDE 9.3—PostgreSQL
- ArcSDE 9.3—SQL Server
- ArcGIS Server Enterprise 9.2—DB2
- ArcGIS Server Enterprise 9.2—Informix
- ArcGIS Server Enterprise 9.2—Oracle
- ArcGIS Server Enterprise 9.2—SQL
- ArcGIS Server Enterprise 9.2—SQL Express
- ArcSDE 9.1—DB2
- ArcSDE 9.1—Informix
- ArcSDE 9.1—Oracle
- ArcSDE 9.1—SQL Server
- ArcSDE 9.0—DB2
- ArcSDE 9.0—Informix
- ArcSDE 9.0—Oracle
- ArcSDE 9.0—SQL Server
- ArcSDE 8.1—DB2
- ArcSDE 8.1—Informix
- ArcGIS 8.1—OLE/COM
- Spatial Database Engine™ Datajoiner 3.0.2—DB2
- Spatial Database Engine Datajoiner 3.0.2—Informix
Spatial Database Engine Datajoiner 3.0.2—Oracle

SFS SQL Types and Functions (TF) 1.1 (Compliance Alternative)
- ArcGIS Enterprise 10.5—SAP HANA
- ArcGIS Enterprise 10.5—DB2
- ArcGIS Enterprise 10.5—Informix
- ArcGIS Enterprise 10.5—SQL Server
- ArcGIS Enterprise 10.5—SQLite
- ArcGIS Enterprise 10.5—Netezza
- ArcGIS Enterprise 10.5—Oracle
- ArcGIS Enterprise 10.5—PostgreSQL
- ArcGIS Enterprise 10.5—Teradata
- ArcGIS Enterprise 10.5—Dameng
- ArcGIS 10.4 for Server—SAP HANA
- ArcGIS 10.4 for Server—DB2
- ArcGIS 10.4 for Server—Informix
- ArcGIS 10.4 for Server—SQL Server
- ArcGIS 10.4 for Server—SQLite
- ArcGIS 10.4 for Server—Netezza
- ArcGIS 10.4 for Server—Oracle
- ArcGIS 10.4 for Server—PostgreSQL
- ArcGIS 10.4 for Server—Teradata
- ArcGIS 10.3 for Server—PostgreSQL
- ArcGIS 10.3 for Server—DB2
- ArcGIS 10.3 for Server—Informix
- ArcGIS 10.3 for Server—Oracle
- ArcGIS 10.3 for Server—Netezza
- ArcGIS 10.3 for Server—SQLite
- ArcGIS 10.3 for Server—Teradata
- ArcGIS 10.2 for Server—PostgreSQL
- ArcGIS 10.2 for Server—DB2
- ArcGIS 10.2 for Server—Informix
- ArcGIS 10.2 for Server—Oracle
- ArcGIS 10.2 for Server—Netezza
- ArcGIS 10.2 for Server—SQLite
- ArcGIS 10.2 for Server—Teradata
- ArcGIS 10.1 for Server Enterprise (ArcSDE)—DB2
- ArcGIS 10.1 for Server Enterprise (ArcSDE)—Informix
- ArcGIS 10.1 for Server Enterprise (ArcSDE)—Oracle
- ArcGIS 10.1 for Server Enterprise (ArcSDE)—PostgreSQL
- ArcGIS Server Enterprise (ArcSDE) 10.0—DB2
- ArcGIS Server Enterprise (ArcSDE) 10.0—Informix
- ArcGIS Server Enterprise (ArcSDE) 10.0—Oracle
- ArcGIS Server Enterprise (ArcSDE) 10.0—PostgreSQL
- ArcGIS Server Enterprise (ArcSDE) 9.3.1—DB2
- ArcGIS Server Enterprise (ArcSDE) 9.3.1 — Informix
- ArcGIS Server Enterprise (ArcSDE) 9.3.1 — Oracle
- ArcGIS Server Enterprise (ArcSDE) 9.3.1 — PostgreSQL
- ArcGIS Server 9.3 — DB2
- ArcSDE 9.3 — Informix
- ArcSDE 9.3 — Oracle
- ArcSDE 9.3 — PostgreSQL
- ArcGIS Server Enterprise 9.2 — DB2
- ArcGIS Server Enterprise 9.2 — Informix
- ArcGIS Server Enterprise 9.2 — Oracle
- ArcSDE 9.1 — DB2
- ArcSDE 9.1 — Informix
- ArcSDE 9.0 — DB2
- ArcSDE 9.0 — Informix
- ArcSDE 8.1 — DB2
- ArcSDE 8.1 — Informix
- Spatial Database Engine Datajoiner 3.0.2 — DB2
- Spatial Database Engine Datajoiner 3.0.2 — Informix
- Spatial Database Engine Datajoiner 3.0.2 — Oracle

*SFS Binary Geometry (BG) 1.1 (Compliance Alternative)*
- ArcGIS Enterprise 10.5 — Oracle
- ArcGIS Enterprise 10.5 — SQL
- ArcGIS 10.4 for Server — Oracle
- ArcGIS 10.4 for Server — SQL Server
- ArcGIS 10.3 for Server — Oracle
- ArcGIS 10.3 for Server — SQL Server
- ArcGIS 10.2 for Server — Oracle
- ArcGIS 10.2 for Server — SQL Server
- ArcGIS 10.1 for Server Enterprise (ArcSDE) — Oracle
- ArcGIS 10.1 for Server Enterprise (ArcSDE) — SQL Server
- ArcGIS Server Enterprise (ArcSDE) 10.0 — Oracle
- ArcGIS Server Enterprise (ArcSDE) 10.0 — SQL Server
- ArcGIS Server Enterprise (ArcSDE) 9.3.1 — Oracle
- ArcGIS Server Enterprise (ArcSDE) 9.3.1 — SQL Server
- ArcSDE 9.3 — Oracle
- ArcSDE 9.3 — SQL Server
- ArcGIS Server Enterprise 9.2 — Oracle
- ArcGIS Server Enterprise 9.2 — SQL Server
- ArcGIS Server Enterprise 9.2 — SQL Server Express
- ArcSDE 9.1 — Oracle
- ArcSDE 9.1 — SQL Server
- ArcSDE 9.0 — Oracle
- ArcSDE 9.0 — SQL Server
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For information on OGC compliancy on Chinese language Esri products:
http://www.opengeospatial.org/resource/products/compliant

See above for a list of Esri products that have OGC compliancy certificates. Having OGC compliancy also means there is an OGC standard implementation. Here is the list of Esri products that implement OGC standards for which there are no compliancy tests:

*Catalogue Service Specification Catalog Service for the Web (CSW) 2.0.2*
- ArcGIS 10.3 for Desktop
- ArcGIS 10.2 for Desktop
- ArcGIS 10.1 for Desktop
- ArcGIS Desktop 10.0
- ArcGIS 9.3
- Esri Geoportal Server 1.2.6
- Esri Geoportal Server 1.2.5
- Esri Geoportal Server 1.2.4
- Esri Geoportal Server 1.2.2
- GIS Portal Toolkit 9.3
- GIS Portal Toolkit 3.1
- ArcGIS Explorer

*CSW 2.0.2—ISO Metadata Application Profile 1.0.0*
- ArcGIS Server Geoportal extension 10.0
- Esri Geoportal Server 1.2.6
- Esri Geoportal Server 1.2.5
- Esri Geoportal Server 1.2.4
- Esri Geoportal Server 1.2.2

*CSW 2.0.1*
- ArcGIS 10.1 for Desktop
- ArcGIS Desktop 10.0
- ArcGIS Server Geoportal extension 10.0
- ArcGIS Server Geoportal extension 9.3.1
- ArcGIS 9.3
- GIS Portal Toolkit 9.3
- ArcIMS Metadata Server 9.0
- ArcGIS Explorer
- GIS Portal Toolkit 3.1
- GIS Portal Toolkit 2.0
Catalog Interface 1.1.1
- ArcGIS Server Geoportal extension 9.3.1
- GIS Portal Toolkit 9.3
- ArcIMS Metadata Server 9.0
- ArcIMS Metadata Server 4.0.1
- ArcIMS Metadata Server 4.0
- GIS Portal Toolkit 2.0

Catalog Interface 1.0
- ArcGIS Server Geoportal extension 10.0
- ArcGIS Server Geoportal extension 9.3.1
- GIS Portal Toolkit 9.3
- ArcIMS Metadata Server 9.0
- ArcIMS Metadata Server 4.0.1
- ArcIMS Metadata Server 4.0
- GIS Portal Toolkit 3.1
- GIS Portal Toolkit 2.0

CSW—Part 1: ebRIM Profile of CSW 1.0.0
- ArcGIS Server Geoportal extension 9.3.1
- GIS Portal Toolkit 9.3
- GIS Portal Toolkit 3.1

CSW—ebRIM Registry Service—Part 2: Basic Extension Package 1.0.0
- ArcGIS Server Geoportal extension 9.3.1
- GIS Portal Toolkit 9.3
- GIS Portal Toolkit 3.1

City Geography Markup Language (CityGML) Encoding Standard 1.0
- ArcGIS 10.4 for Desktop
- ArcGIS 10.3 Data Interoperability extension
- ArcGIS 10.2.2 Data Interoperability extension
- ArcGIS 10.2.1 Data Interoperability extension
- ArcGIS Data Interoperability 9.3 extension

Filter (Filter) Encoding Implementation Specification 2.0
- ArcGIS 10.4 for Server
- ArcGIS 10.3.1 for Server
- ArcGIS 10.3 for Server
- ArcGIS 10.3

Filter 1.1
- ArcGIS 10.4 for Server
- ArcGIS 10.3.1 for Server
- ArcGIS 10.3 for Server
- ArcGIS 10.2.2 for Server
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- ArcGIS 10.2.1 for Server
- ArcGIS 10.1 for Server
- ArcGIS Server 10.0
- ArcGIS Server Geoportal extension 10.0
- ArcGIS Server 9.3.1
- ArcGIS Server Geoportal extension 9.3.1
- ArcGIS Server 9.3 SP1
- GIS Portal Toolkit 9.3
- GIS Portal Toolkit 3.1

Filter 1.0
- ArcGIS 10.4 for Server
- ArcGIS 10.3.1 for Server
- ArcGIS 10.3 for Server
- ArcGIS 10.2.2 for Server
- ArcGIS 10.2.1 for Server
- ArcGIS 10.2 for Server
- ArcGIS 10.1
- ArcGIS 10.0
- ArcGIS Server 10.0
- ArcGIS Server 9.3.1
- ArcGIS Server Geoportal extension 9.3.1
- ArcGIS Server 9.3 SP1
- ArcGIS 9.3
- GIS Portal Toolkit 9.3
- ArcGIS 9.2
- ArcIMS 9.1 SP1
- ArcIMS 9.1
- ArcIMS 4.0.1
- ArcIMS 4.0
- GIS Portal Toolkit 3.1

Geographic Markup Language (GML) Encoding Standard 3.2.1
- ArcGIS 10.4 for Server
- ArcGIS 10.3.1 for Server
- ArcGIS 10.3 for Server
- ArcGIS 10.3 for Desktop
- ArcGIS 10.3 Data Interoperability extension
- ArcGIS 10.2 for Server
- ArcGIS Server 9.3.1
- ArcGIS Server 9.3 SP1

GML Encoding Specification 3.1.1
- ArcGIS 10.3
- ArcGIS 10.2.2
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- ArcGIS 10.2.1 for Server
- ArcGIS 10.2 for Server
- ArcGIS 10.1 for Server
- ArcGIS Server 10.0
- ArcGIS Server 9.3.1
- ArcGIS Server 9.3 SP1

**GML 3.1.1 Simple Feature Profile 1.0.0**
- ArcGIS 10.3
- ArcGIS 10.2
- ArcGIS 10.1
- ArcGIS 10.0
- ArcGIS Server 10.0
- ArcGIS Server 9.3.1
- ArcGIS Server 9.3 SP1
- ArcGIS 9.3
- ArcGIS 9.2

**GML 3.0**
- ArcGIS 10.3 for Desktop
- ArcGIS 10.2.2
- ArcGIS 10.2.2 for Server
- ArcGIS 10.2.1
- ArcGIS 10.2.1 for Server
- ArcGIS 10.2 for Server
- ArcIMS 9.1 SP1
- ArcIMS 9.1
- ArcGIS Data Interoperability 9.0 extension
- ArcIMS Data Delivery 9.0 extension

**GML 2.1.2**
- ArcGIS 10.4 for Server
- ArcGIS 10.3.1 for Server
- ArcGIS 10.3 for Server
- ArcGIS 10.3 for Desktop
- ArcGIS 10.2.2 for Desktop
- ArcGIS 10.2.2 for Server
- ArcGIS 10.2.1
- ArcGIS 10.2.1 for Server
- ArcGIS 10.2 for Server
- ArcIMS 9.1 SP1
- ArcIMS 9.1
- ArcGIS Data Interoperability 9.0 extension
- ArcIMS Data Delivery 9.0 extension
- ArcIMS 4.0.1
- ArcIMS 4.0

**GML 2.1.1**
- ArcGIS 10.4 for Server
- ArcGIS 10.3.1 for Server
- ArcGIS 10.3 for Server
- ArcGIS 10.3 for Desktop
- ArcGIS 10.4 Data Interoperability extension
- ArcGIS 10.3 Data Interoperability extension
- ArcGIS 10.2.2
- ArcGIS 10.2.2 for Server
- ArcGIS 10.2.1 for Server
- ArcGIS 10.2 for Server
- ArcIMS 9.1 SP1
- ArcIMS 9.1
- ArcGIS Data Interoperability 8.3 toolbar add-on
- ArcIMS 4.0.1
- ArcIMS 4.0

**GeoPackage—**with *Corrigendum* 1.0.1
- ArcGIS Pro 1.4
- ArcGIS Desktop 10.5 (ArcMap)

**GeoPackage 1.00**
- ArcGIS 10.4 for Server
- ArcGIS 10.4 for Desktop
- ArcGIS Runtime
- ArcGIS 10.3.1 for Server
- ArcGIS 10.3 for Desktop
- ArcGIS 10.2.2 for Desktop
- ArcGIS 10.2.1 for Desktop

**GeoRSS, Introduction 1.0.0**
- Esri Geoportal Server 1.2.6
- Esri Geoportal Server 1.2.5
- Esri Geoportal Server 1.2.4
- ArcGIS Server Geoportal extension 10.0
- ArcGIS Server Geoportal extension 9.3.1
- GIS Portal Toolkit 9.3

**KML 2.3.1.0**
- ArcGIS 10.4 for Desktop

**KML 2.2.0**
- ArcGIS 10.4 for Desktop
- ArcGIS 10.3.1 for Server
- ArcGIS 10.3 for Server
- ArcGIS 10.3 for Desktop
- ArcGIS Online
- Portal 10.3 for ArcGIS
- Portal 10.2 for ArcGIS
- ArcGIS 10.3 Data Interoperability extension
- ArcGIS 10.2.2
- ArcGIS 10.2.2 for Server
- ArcGIS 10.2.1
- ArcGIS 10.2.1 for Server
- ArcGIS 10.2 for Server
- ArcGIS 10.1
- ArcGIS 10.0
- ArcGIS Server 10.0
- Esri Geoportal Server 1.2.6
- Esri Geoportal Server 1.2.5
- Esri Geoportal Server 1.2.4
- ArcGIS Server Geoportal extension 10.0
- ArcGIS Server Geoportal extension 9.3.1
- ArcGIS Server 9.3 SP1
- GIS Portal Toolkit 9.3

**KML 2.1 Reference—An OGC Best Practice 2.1.0**
- ArcGIS 10.4 for Desktop
- ArcGIS 10.3 for Desktop
- ArcGIS 10.2.2
- Portal 10.3 for ArcGIS
- Portal 10.2 for ArcGIS
- ArcGIS Online
- ArcGIS 10.2.2 for Server
- ArcGIS 10.2.1
- ArcGIS 10.2.1 for Server
- ArcGIS 10.2 for Server
- ArcGIS 10.1
- ArcGIS 10.0
- ArcGIS Server Geoportal extension 10.0
- ArcGIS Server Geoportal extension 9.3.1
- ArcGIS Server 9.3 SP1
- GIS Portal Toolkit 9.3

**Location Services (OpenLS) Implementation Specification: Core Services 1.1**
- ArcIMS 9.1
- ArcIMS 9.0
- ArcWeb\textsuperscript{SM} Services 2006
OpenLS Core Services (Parts 1–5) 1.0
- ArcIMS 9.1
- ArcIMS 9.0
- ArcWeb Services 2006

OpenLS Core Services (Part 1: Directory Service) 1.0
- ArcIMS 9.1
- ArcIMS 9.0
- ArcWeb Services 2006

OpenLS Core Services (Part 2: Gateway Service) 1.0
- ArcWeb Services 2006

OpenLS Core Services (Part 3: Location Utility Service) 1.0
- ArcIMS 9.1
- ArcIMS 9.0
- ArcWeb Services 2006

OpenLS Core Services (Part 4: Presentation Service) 1.0
- ArcIMS 9.1
- ArcIMS 9.0
- ArcWeb Services 2006

OpenLS Core Services (Part 5: Route Service) 1.0
- ArcIMS 9.1
- ArcIMS 9.0
- ArcWeb Services 2006

SFS Access 1.1
- ArcGIS 10.3 for Desktop
- ArcGIS 10.2.2 for Server
- ArcGIS 10.2 for Server
- ArcGIS Server 9.3.1
- ArcGIS Server 9.3 SP1

SFS—OLE/COM 1.1
- ArcGIS Server 9.3.1
- ArcGIS Server 9.3 SP1

SFS—SQL Binary Geometry 1.1
- ArcGIS 10.1
- ArcGIS 10.0
- ArcGIS Server 9.3 SP1
SF—SQL Types and Functions 1.1
- ArcGIS 10.1 for Server
- ArcGIS Server 10.0
- ArcGIS Server 9.3 SP1

SF—SQL Normalized Geometry 1.1
- ArcGIS Server 9.3 SP1

Sensor Observation Service (SOS) 1.0.0
- ArcGIS 10.3 for Server
- ArcGIS 10.2.2 for Server
- ArcGIS 10.2.1 for Server
- ArcGIS 10.2 for Server

Styled Layer Descriptor (SLD) Implementation Specification 1.0
- ArcGIS 10.4 for Server
- ArcGIS 10.3.1 for Server
- ArcGIS 10.3 for Server
- ArcGIS 10.3 for Desktop
- ArcGIS 10.2.2 for Server
- ArcGIS 10.2.1 for Server
- ArcGIS 10.2 for Server
- ArcGIS 10.3
- ArcGIS 10.2
- ArcGIS 10.1
- ArcGIS 10.0
- ArcGIS Server 10.0
- ArcGIS Server Geoportal extension 10.0
- ArcGIS Server 9.3.1
- ArcGIS Server Geoportal extension 9.3.1
- ArcGIS Server 9.3 SP1
- ArcGIS 9.3
- GIS Portal Toolkit 9.3
- ArcGIS 9.2
- ArcIMS 9.1 SP1
- ArcIMS 9.1
- ArcIMS 4.0.1
- ArcIMS 4.0
- GIS Portal Toolkit 3.1

Web Map Context (Context) Implementation Specification 1.1
- ArcGIS 10.2.2
- ArcGIS 10.2.1
Context Document 1.0
- ArcExplorer™ Web
- ArcGIS 9.3
- GIS Portal Toolkit 2.0

Web Coverage Standard (WCS) 2.0.1
- ArcGIS 10.3 for Server

WCS 2.0 Corrigendum 2.0.1
- ArcGIS 10.4 for Desktop

WCS 1.1.2
- ArcGIS 10.4 for Desktop
- ArcGIS 10.3.1 for Server
- ArcGIS 10.3 for Desktop

WCS Corrigendum 1. 1.1.1
- ArcGIS 10.4 for Server
- ArcGIS 10.4 for Desktop
- ArcGIS 10.3.1 for Server
- ArcGIS 10.3 for Desktop
- ArcGIS 10.2.2
- ArcGIS 10.2.2 for Server
- ArcGIS 10.2.1
- ArcGIS 10.2.1 for Server
- ArcGIS 10.1
- ArcGIS 10.0
- ArcGIS Server 10.0
- ArcGIS Server Geoportal extension 10.0
- ArcGIS Server 9.3.1
- ArcGIS Server Geoportal extension 9.3.1
- ArcGIS Server 9.3 SP1
- ArcGIS 9.3
- GIS Portal Toolkit 9.3
- GIS Portal Toolkit 3.1

WCS 1.1.0
- ArcGIS 10.3
- ArcGIS 10.2
- ArcGIS 10.1
- ArcGIS 10.0
- ArcGIS 10.3 for Server
- ArcGIS 10.2 for Server
- ArcGIS Server 10.0
ArcGIS Server 9.3.1
ArcGIS Server 9.3 SP1
ArcGIS 9.3

WCS Corrigendum 1.0.0
ArcGIS 10.4 for Desktop
ArcGIS 10.3.1 for Server
ArcGIS 10.3 for Desktop
ArcGIS 10.3 for Server
ArcGIS 10.2.2
ArcGIS 10.2 for Server
ArcGIS 10.2.1
ArcGIS 10.2.1 for Server
ArcGIS 10.1
ArcGIS 10.0
ArcGIS Server Geoportal extension 10.0
ArcGIS Server 9.3.1
ArcGIS Server Geoportal extension 9.3.1
ArcGIS Server 9.3 SP1
ArcGIS 9.3
GIS Portal Toolkit 9.3
ArcGIS 9.0
ArcGIS Server 9.0
GIS Portal Toolkit 3.1
GIS Portal Toolkit 2.0

Web Feature Service (WFS) Interface Standard 2.0 (also ISO 19142)
ArcGIS 10.4 for Server
ArcGIS 10.4 for Desktop
ArcGIS 10.3.1 for Server
ArcGIS 10.3 for Server
ArcGIS 10.3

WFS 1.1.0
ArcGIS 10.4 for Server
ArcGIS 10.4 for Desktop
ArcGIS 10.3.1 for Server
ArcGIS 10.3 for Server
ArcGIS 10.3 for Desktop
ArcGIS 10.2.2
ArcGIS 10.2.2 for Server
ArcGIS 10.2.1
ArcGIS 10.2.1 for Server
ArcGIS 10.2 for Server
ArcGIS 10.1
- ArcGIS 10.1 for Server
- ArcGIS 10.0
- ArcGIS Server 10.0
- ArcGIS Server Geoportal extension 10.0
- ArcGIS Server 9.3.1
- ArcGIS Server Geoportal extension 9.3.1
- ArcGIS Server 9.3 SP1
- ArcGIS 9.3
- GIS Portal Toolkit 9.3
- ArcIMS 4.0.1
- ArcIMS 4.0
- GIS Portal Toolkit 3.1

**WFS Transactional (WFS-T) 1.1.0**
- ArcGIS 10.3 for Server
- ArcGIS 10.3 for Desktop
- ArcGIS 10.2.1 for Server
- ArcGIS 10.2 for Server
- ArcGIS 10.2 for Server
- ArcGIS Server 10.0

**WFS-T 1.0.0**
- ArcGIS 10.3 for Server
- ArcGIS 10.2.1 for Server
- ArcGIS 10.2 for Server
- ArcGIS 10.1 for Server
- ArcGIS Server 10.0

**WFS 1.0.0**
- ArcGIS 10.4 for Desktop
- ArcGIS 10.3.1 for Server
- ArcGIS 10.3 for Desktop
- ArcGIS 10.3 for Server
- ArcGIS 10.2.2
- ArcGIS 10.2.1 for Server
- ArcGIS 10.2.1
- ArcGIS 10.2.1 for Server
- ArcGIS 10.1
- ArcGIS 10.0
- ArcGIS Server Geoportal extension 10.0
- ArcGIS Server Geoportal extension 9.3.1
- ArcGIS 9.3
- GIS Portal Toolkit 9.3
- ArcGIS 9.2
- ArcIMS 9.1
ArcGIS Data Interoperability 9.0 extension
ArcIMS Data Delivery 9.0 extension
ArcGIS Data Interoperability 8.3 toolbar add-on
ArcIMS 4.0
GIS Portal Toolkit 3.1
GIS Portal Toolkit 2.0

Web Map Service (WMS) Implementation Specification 1.3.0
ArcGIS 10.4 for Desktop
ArcGIS 10.3.1 for Server
ArcGIS 10.3 for Server
ArcGIS Online
ArcGIS Runtime
ArcGIS API for JavaScript
Portal 10.3 for ArcGIS
Portal 10.2 for ArcGIS
ArcGIS 10.3 for Desktop
ArcGIS 10.2.2
ArcGIS 10.2.2 for Server
ArcGIS 10.2.1
ArcGIS 10.2.1 for Server
ArcGIS 10.1
ArcGIS 10.0
ArcGIS Server Geoportal extension 10.0
ArcGIS Server 9.3 SP1
ArcGIS 9.3
GIS Portal Toolkit 9.3
ArcGIS 9.2
Esri Geoportal Server 1.2.6
Esri Geoportal Server 1.2.5
Esri Geoportal Server 1.2.4
ArcGIS Server Geoportal extension 9.3.1
GIS Portal Toolkit 3.1
ArcGIS Explorer

WMS Client Implementation Specification 1.3.0
ArcGIS 10.3 for Desktop

WMS 1.1.1
ArcGIS 10.4 for Desktop
ArcGIS 10.3.1 for Server
ArcGIS 10.3 for Desktop
ArcGIS 10.2.2 for Desktop
ArcGIS 10.2.1 for Server
ArcGIS Online
- ArcGIS Runtime
- ArcGIS API for JavaScript
- Portal 10.3 for ArcGIS
- Portal 10.2 for ArcGIS
- ArcGIS 10.2.1 for Desktop
- ArcGIS 10.2 for Server
- ArcGIS 10.1.1 for Desktop
- ArcGIS Desktop 10.0
- ArcGIS Server Geoportal extension 10.0
- ArcGIS Server 9.3.1
- ArcGIS Server Geoportal extension 9.3.1
- ArcGIS Server 9.3 SP1
- ArcGIS 9.3
- GIS Portal Toolkit 9.3
- ArcGIS 9.2
- ArcIMS 9.1 SP1
- ArcGIS 9.0
- ArcExplorer Web
- ArcGIS Explorer
- ArcIMS 4.0.1
- ArcIMS 4.0
- GIS Portal Toolkit 3.1
- GIS Portal Toolkit 2.0

WMS 1.1
- ArcGIS 10.4 for Server
- ArcGIS 10.4 for Desktop
- ArcGIS 10.3.1 for Server
- ArcGIS 10.3 for Desktop
- ArcGIS 10.2.2 for Desktop
- ArcGIS Online
- ArcGIS Runtime
- ArcGIS API for JavaScript
- Portal 10.3 for ArcGIS
- ArcGIS 10.2.2 for Server
- ArcGIS 10.2.1 for Desktop
- ArcGIS 10.2.1 for Server
- ArcGIS 10.2 for Server
- ArcGIS Server 9.3.1
- ArcGIS Server 9.3 SP1
- ArcIMS 9.0
- ArcExplorer Web
- ArcGIS Explorer
- ArcGIS Data Interoperability 8.3 toolbar add-on
- ArcIMS 4.0.1
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- ArcIMS 4.0
- GIS Portal Toolkit 2.0

**WMS 1.0**
- ArcGIS 10.4 for Desktop
- ArcGIS 10.3.1 for Server
- ArcGIS 10.3 for Desktop
- ArcGIS Runtime
- ArcGIS API for JavaScript
- ArcGIS 10.2.2 for Desktop
- ArcGIS 10.2.2 for Server
- ArcGIS 10.2.1 for Desktop
- ArcGIS 10.2.1 for Server
- ArcGIS 10.2 for Server
- ArcGIS Server 9.3.1
- ArcGIS Server 9.3 SP1
- ArcIMS 9.0
- ArcExplorer Web
- ArcGIS Explorer
- ArcIMS 4.0
- ArcIMS 3.0
- GIS Portal Toolkit 2.0

**Web Map Tile Service (WMTS) Implementation Standard 1.0.0**
- ArcGIS 10.4 for Server
- ArcGIS 10.4 for Desktop
- ArcGIS 10.3.1 for Server
- ArcGIS 10.3 for Server
- ArcGIS 10.3 for Desktop
- ArcGIS Online
- ArcGIS Runtime
- ArcGIS API for JavaScript
- Portal 10.3 for ArcGIS
- ArcGIS 10.2.2 for Server
- ArcGIS 10.2.1 for Desktop
- ArcGIS 10.2.1 for Server
- ArcGIS 10.2 for Server
- ArcGIS 10.1 for Desktop
- ArcGIS 10.1 for Server

**Web Processing Service (WPS) 1.0.0**
- ArcGIS 10.4 for Desktop
- ArcGIS 10.3.1 for Server
- ArcGIS 10.3 for Server
- ArcGIS 10.3 for Desktop
ISO/TC 211 Standards

Most ISO Technical Committee 211 (TC 211) standards are conceptual in nature, providing the underpinnings for many OGC implementation standards. They are used in the development of national and information community profiles and application schema standards and/or in the design of geographic management and production systems. They are often called Normative Standards. OGC and ISO/TC 211 work closely together. Members of the Esri standards team participate in the development of OGC and ISO/TC 211 standards.

Some of the ISO/TC 211 standards that inform Esri products include the following:

ISO 6709:2008—Standard representation of latitude, longitude, and altitude for geographic point locations; 6709/Cor. 1
This standard specifies a variable-length format to represent latitude, longitude, and altitude for data interchange used in Esri products.

ISO 19101:2002—Reference model
ISO 19101-1—Reference model—Part 1: Fundamentals
These standards provide a framework for the 191** Family of Standards and are used by Esri and others to understand the organization of ISO/TC 211 standards and how they work together.

ISO 19103:2005—Conceptual schema language
ISO 19103—Conceptual schema language
These standards provide Esri and other users with an understanding of the UML and basic types and Object Constraint Language used in the ISO/TC 211 standards.

ISO 19104:2008—Terminology
This standard provides an understanding of the terminology used by the ISO/TC 211 standards.

ISO 19106:2004—Profiles
A profile is a subset of one or more generic standards with selected options. A profile provides the limited scope and functionality for effective specialist implementations of data and systems. Esri uses this standard to understand ISO and OGC profiles and when it is working with organizations to develop profiles.

ISO 19107:2003—Spatial schema
This standard defines and describes a fundamental model for computer representations of geometry and topology that is referenced to reality by coordinates systems. 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 the design of geodatabases. This is the foundation for Simple Features GML and all standards that deal with vector geometry and topology.

**ISO 19108:2002—Temporal schema ISO 19108/Cor. 1**
This standard defines standard concepts needed to describe the temporal characteristics of geographic information. Esri supports the concepts in this standard in metadata and the handling of time-aware data in ArcGIS.

**ISO 19109:2005—Rules for application schema**
These standards define the general feature model and rules for creating and documenting application schemas for modeling features and their properties, allowing physical applications to understand and share data modeling features and their properties. Using the concepts described in these standards, 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 these standards. Esri also uses the same concepts as the general feature model (GFM) as defined in the standards.

**ISO 19110:2005—Methodology for feature cataloging**
These standards describe a methodology for creating a catalog defining features and properties for a domain of interest and/or a dataset and schema for encoding in XML. Esri participates in several standards organizations to develop encoding for feature catalogs based on the concepts in these standards. Encoded catalogs can be used as additional metadata.

**ISO 19111:2007—Spatial referencing by coordinates**
These standardize a common method for defining coordinate reference systems. Esri implements the basic concepts defined in these standards through GML and in coordinate reference system libraries in ArcGIS.

**ISO 19112:2003—Spatial referencing by geographic identifiers**
This details the metadata about/defining a reference system that uses spatial unit identifiers other than coordinates (e.g., gazetteer, postal codes). 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 (replaced by ISO 19157)**
This defines the principles and elements/subelements of data quality. Esri implements the concepts in this standard in its mapping and charting solution products and database production services. See ISO 19157 below.
ISO 19114:2003—Quality evaluation procedures ISO 19114/Cor. 1 (replaced by ISO 19157)
This defines procedures for determining data quality. Esri implements the concepts in these standards in its mapping and charting solution products and database production services. See ISO 19157 below.

ISO 19115:2003—Metadata; 19115/Cor. 1 (replaced by 19115-1)
This defines metadata elements and schema describing geospatial datasets. 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 led the revision project.

ISO 19115-1—Metadata—Part 1: Fundamentals
This details the revision of ISO 19115, which defines metadata elements and schema describing geospatial resources (i.e., datasets and services).

ISO 19115-2:2009—Metadata—Part 2: Extensions for imagery and gridded data
This defines additional metadata elements and schema describing imagery and gridded geospatial datasets.

ISO 19117:2005—Portrayal
ISO 19117—Portrayal
These standards provide applications with a common interface to support standard symbol sets. These concepts are used by the OGC Styled Layer Descriptor specification. See OGC Styled Layer Descriptor (SLD) Implementation Specification.

ISO 19118:2005—Encoding
ISO 19118—Encoding
These define an encoding rule based on XML. Esri used the concepts defined in these standards while leading the development of SF-GML and ISO 19139.

ISO 19119:2005—Services
ISO 19119/Amd. 1
ISO 19119—Services
These provide a framework and define the metadata for services, enabling users to access and process geographic information across a generic computing interface. The metadata portions of these standards have been moved to ISO 19115-1. Esri is using the concepts defined in these standards in its implementation of the OGC W*S specifications.

ISO 19123:2005—Schema for coverage geometry and functions
This defines the conceptual schema for the spatial characteristics of mapping from a collection of points in a coordinate space to attribute values where attribute types are common to all geographic positions within the spatial domain called coverages. Esri uses the concepts defined in this standard for exchanging and interfacing with raster, matrix, and TIN structures.
ISO 19125-1:2004—Simple feature access—Part 1: Common architecture
This describes the common architecture for simple feature geometry based on the concepts in ISO 19107. See OGC Information Specification for Geospatial Information—Simple Features Access 1.1 in Part 1: Esri OGC Compliant Products above.

ISO 19125-2:2004—Simple feature access—Part 2: SQL option
This standard specifies a SQL schema that supports storage, retrieval, query, and update of simple geospatial feature collections based on the architecture defined in part 1. See OGC Information Specification for Geospatial Information—Simple Features Access 1.1 in Part 1: Esri OGC Compliant Products above.

ISO 19126:2009—Profile—FACC Data Dictionary
This is a profile of ISO 19110 used by the defense community. Esri implements this standard in the Esri Defense Mapping solution and database production work.

ISO 19128:2005—Web Map Server interface
This specifies a service for rendering spatially referenced digital image maps for display on a computer screen, dynamically derived from geographic information. See OGC WMS Implementation Specification 1.3.0 above.

ISO 19130:2010—Sensor and data models for imagery and gridded data
This specifies a sensor model describing the physical and geometric properties of frame, whisk broom, and push broom sensors. Esri uses these concepts when exploiting remotely sensed imagery.

ISO 19130-2—Sensor and data models for imagery and gridded data—Part 2: SAR, InSAR, Lidar, and Sonar
This specifies a sensor model describing the physical and geometrical properties of the identified sensors. Esri follows the general modeling concepts in the use of Lidar and Sonar.

ISO 19131:2007—Data product specifications
This standard provides requirements for the specification of geographic data products. These include the application schema, spatial and temporal referencing systems, quality and data capture, and maintenance processes. Esri is required to understand and respond to these requirements in data production.

ISO 19136:2007—Geography Markup Language
This standard provides an XML encoding and XML schema syntax that allows an open, vendor-neutral framework for the definition of geospatial application schemas and objects for the storage and transportation of application schemas and datasets. See OGC Geography Markup Language Encoding Standard and Geography Markup Language versions above.

ISO 19138:2006—Data quality measures (replaced by ISO 19157)
This defines commonly used measures for reporting data quality for the sub elements defined in ISO 19113 and a structure so they may be maintained in a
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register. Esri implements the concepts in these standards in its mapping and charting solution products and database production services. See ISO 19157 below.

ISO 19139:2007—Metadata—XML schema implementation
This provides encoding rules and a schema for implementing ISO 19115 in XML. Esri implements these concepts in our metadata tools found in ArcGIS.

ISO 19142:2010—Web Feature Service
This specifies a web service that provides direct, fine-grained access to geographic information at the feature and feature property level. See OGC WFS Interface Standard.

ISO 19143:2010—Filter encoding
This standard describes an XML and key-value pair (KVP) encoding of a system-neutral syntax for expressing projections and selection and sorting clauses, collectively called a query expression. See OGC Filter Encoding Standard.

ISO 19144-1:2009—Classification Systems—Part 1: Classification system structure
This specifies the general criteria and structure of a land-cover classification system. Esri supports the concepts defined in this standard when dealing with land classification systems.

ISO 19144-2—Classification systems—Part 2: Land Cover Meta Language
This specifies a Land Cover Meta Language (LCML) expressed as a UML meta-model that allows different land-cover classification systems to be described based on physiognomic aspects. Esri supports the concepts defined in this standard when dealing with land classification systems.

ISO 19156—Observations and measurements
This standard defines a conceptual schema for observations and features involved in sampling when making observations—an act that results in the estimation of the value of a feature property. Esri implements these concepts when dealing with sensor observations.

ISO 19157—Data quality (revision of ISO 19113, 19114, and 19138)
This defines the principles and components for describing and evaluating data quality and the measures used for reporting it. This revises and replaces ISO 19113, 19114, 19138. Esri participated in the development of this standard.

ISO 19158—Quality assurance of data supply
This technical specification provides a quality assurance framework for the producer and customer in their production relationship. It identifies methods of managing the quality of production more efficiently and effectively. Esri follows these principles when working with customers during database production.
ISO 15836:2009—*The Dublin Core metadata element set*
These define the -domain resource descriptions, which are not limited to specific resources. Esri implements these concepts in our metadata support products.

ISO 19115-2—Metadata—Part 2: Extensions for imagery and gridded data
*(Revision of ISO 19115-2:2009)*
This defines additional metadata elements and schema describing imagery and gridded geospatial datasets. Esri is leading the revision process for this standard.

ISO 19115-3—Metadata—Part 3: XML schema implementation of metadata fundamentals
This provides a schema for implementing ISO 19115-1 in XML. Esri is participating in the development of this standard and has performed test implementations.

This provides a schema for implementing ISO 19157 in XML. Esri is participating in the development of the schema.

ISO 19160-1—Addressing—Part 1: Conceptual model
This defines a conceptual model for address information (address model), together with the terms and definitions that describe the concepts in the model. Esri is participating in the development of this standard.

ISO 19162—Well-known text representation of coordinate reference systems
This standard defines the structure and content of a text string implementation of the abstract model for coordinate reference systems described in ISO 19111:2007 and ISO 19111-2:2009. Esri is actively participating in the development of this standard.

ISO 19165—Preservation of digital data and metadata
This standard will define the rules for the long-term preservation of digital geospatial data. Esri is participating in the development of this standard.

**Additional Resources**
Esri: [esri.com](http://esri.com)
Esri’s Open Vision: [esri.com/software/open](http://esri.com/software/open)
Esri inspires and enables people to positively impact their future through a deeper, geographic understanding of the changing world around them.

Governments, industry leaders, academics, and nongovernmental organizations trust us to connect them with the analytic knowledge they need to make the critical decisions that shape the planet. For more than 40 years, Esri has cultivated collaborative relationships with partners who share our commitment to solving earth’s most pressing challenges with geographic expertise and rational resolve. Today, we believe that geography is at the heart of a more resilient and sustainable future. Creating responsible products and solutions drives our passion for improving quality of life everywhere.