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**Supporting GEOSS Common Architecture and Societal
Benefit Areas Pilot development**

in the

**GEOSS Architecture Implementation Pilot – Phase 3
(AIP-3)**

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ESRI Response to the GEOSS AIP-3 CFP

1 Overview

Producing and managing better information about the environment has become a top Global priority. GEO was launched in response to calls for action by the 2002 World Summit on Sustainable Development and by the G8 (Group of Eight) leading industrialized countries. These high-level meetings recognized that international collaboration is essential for exploiting the growing potential of Earth observations to support decision making in an increasingly complex and environmentally stressed world.¹

Environmental Systems Research Institute, Inc. (ESRI) has actively participated in Phase 1 and 2 of the Architecture Implementation Pilot and has hosted a candidate for the GEOSS GeoPortal (<http://geoss.esri.com>) since the summer of 2007.

Since completion of Phase 2, ESRI has released ArcGIS 9.3.1 which offers new and extended capabilities that will benefit GEOSS (<http://www.esri.com/software/arcgis/index.html>). ESRI plans to update the existing GEOSS Portal prototype to the most current version of the supporting software to hopefully meet new and evolving GEOSS community needs.

ESRI anticipates supporting the pilot by:

- Participating in the kickoff meeting in Frascati (Italy) March 11th - 12th and participating in weekly calls
- Participating in the Demo Capture Workshop (USA) foreseen for September 2010
- Participating at EO Summit and GEO Plenary, Beijing, China
- Reviewing architecture documents and providing feedback
- Hosting a GEOSS Portal and Clearinghouse prototype based on the latest version of the ESRI ArcGIS Server Geoportal Extension
- Making client components available for searching the GEOSS clearinghouses that may be used in ArcGIS Explorer (free download) or ArcGIS Desktop (for users who have a license to this software).

ESRI recognizes that GEO envisions a comprehensive and coordinated system of systems which will be sustained and yield societal benefits. We are therefore interested in continuing our participation in GEOSS providing voluntary contributions in the form of advisory technical consulting support, sustainable software and solutions, hosting services for demonstration environment, and promoting best practices and partnerships.

¹ http://earthobservations.org/about_geo.shtml

2 Proposed Contributions

2.1 Societal Benefit Area Alignment and Support

At this point in time ESRI is not proposing to enhance the SBA descriptions and deployment. However, the components described in the following section can be exploited to facilitate the development of thematic data and applications contributing to SBAs.

2.2 Component and Service Contributions

ESRI will provide components, including GEOSS Common Infrastructure components, that can be used by other GEOSS contributors to develop thematic application pilots contributing to SBAs as well as discover and use GEOSS contributions. In particular, ESRI components provide a method to share, discover and visualize geographic information. The goal will also be to investigate bi-directional communication mechanisms between resource providers and consumers that may help improve business processes. Figure 1 summarizes the workflow tying together resource providers and consumers.

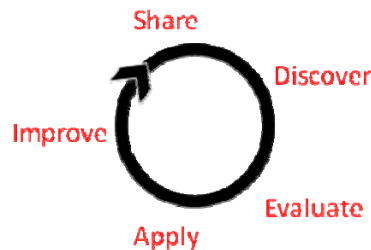


Figure 1: ESRI's SDI workflow for sharing and using resources

ESRI plans to continue hosting components and services in support of GEOSS from its office in Redlands, CA. The components ESRI plans to make available are outlined below (and described in more detail in Section 4 of this response).

- **ArcGIS Server Geoportal Extension** – ESRI will continue to host the prototype GeoPortal and clearinghouse based on ESRI ArcGIS Server Geoportal Extension. ESRI ArcGIS Server Geoportal Extension allows the ability to configure and manage different metadata profiles (e.g. DC, ISO, FGDC, INSPIRE, EO specific) as well as configure and federate distributed catalogues based on different standards. Thanks to the standard interfaces that the clearinghouse offers (OGC CSW 2.0.2, OGC CSW 2.02 ISO AP and related extensions such as INSPIRE, and OpenSearch) aforementioned clearinghouse capabilities can also be used by other GEO Portals or community portals. The goal is to improve the collaboration between GEOSS communities by making the geographic resources used in the pilots broadly visible and accessible across business units and scientific disciplines. Depending on the specific pilot needs this may be achieved by either connecting community portals or relying on the Geoportal itself for publishing, managing and storing relevant

geographic resources used in the pilots. The Geoportal capabilities could potentially be used to support semantic mediation, user identification and data access conditions management.

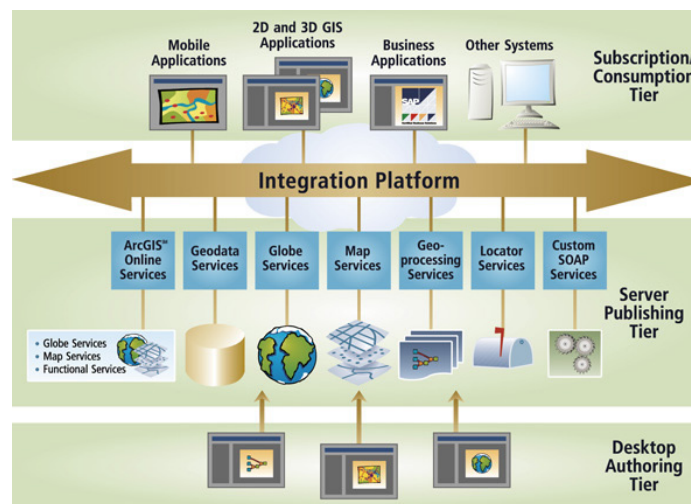
- **Geoviewer** – the Geoviewer (<http://geoss.esri.com/geoviewer>) is a Web application developed for supporting those users willing to discover, visualize and make initial assessments (e.g. estimate population) based on available resources. This component has been used to support Disasters SBA (e.g. Haiti earthquake) and can potentially be useful for other SBAs. Currently it is able to access and visualize a variety of contents including ArcGIS Online, OpenStreetMap, GeoEye and DigitalGlobe imagery, OGC Catalog and Map services, ArcGIS Map and Geoprocessing services, Twitter, and GeoRSS feeds.
- **Web Mapping API** – for those interested in extending Geoviewer functionalities or developing new Web applications for specific SBA scenario needs, ESRI provides a number of helpful resources. The ESRI Web Mapping APIs (<http://www.esri.com/mappingapis>) allow you to develop rich, interactive applications using JavaScript, Flex, or Silverlight. Web Mapping APIs are free for non-commercial use. The ESRI Resource Center (<http://resources.esri.com/arcgisserver/apis/>) offers access to applications exemplifying the functionalities that can be realized with the Web Mapping API. Users can have access to the source codes of the free samples on the ESRI Resource Center. Developers may contribute to the community by sharing their work with others as well. To help developers realize content-rich applications, ArcGIS Online offers free access to many available resources.
- **ArcGIS Explorer** – ESRI makes ArcGIS Explorer available as a free download (<http://www.esri.com/software/arcgis/explorer/index.html>). In combination with the CSW client that is part of the ArcGIS Server Geoportal Extension, this becomes a useful client application that connects to the GEOSS registry for discovery of resources in support of SBA.
- **ArcGIS Online** – Collaborative platforms like ESRI's ArcGIS Online (<http://www.arcgisonline.com/>) are to be considered as a source of relevant data (currently it contains more than 1400 shared maps) that may be used in support of SBA scenarios. ArcGIS Online Services are a collection of 2D maps and 3D globes that can be accessed by ArcGIS Desktop and ArcGIS Explorer users via the Web. This site includes, but is not limited to, satellite imagery for the world and a variety of maps including: a worldwide shaded relief, political world, physical world, world protected areas, and historical world globes. These services may be used in support of SBA scenarios.

Relationship of the components and services to the architecture

Adherence to standards makes it possible for the components mentioned above to integrate with other enterprise systems.

Integrating GIS with other key business systems can extend the value of those systems by increasing accuracy, efficiency, and productivity. It also supports a collaborative environment and allows for the geospatial enabling of a Service Oriented Architecture (SOA). Open APIs allow organizations to build and deploy meaningful applications in a

standardized way and integrate GIS technology into existing applications (for more information, please see <http://www.esri.com/software/standards/index.html>).



Support of open standards by the services

For more than 25 years, ESRI has built open and interoperable commercial off-the-shelf software products. We have always been, and continue to be, keen advocates of the need for open access to geographic data and software functionality using widely adopted, practical standards.

ESRI has considerable experience in the development of standards and specifications including many efforts related to OGC, ANSI, and ISO TC 211. ESRI was the lead author for the OGC Simple Features SQL standard and participated in the COM and CORBA submissions. ESRI serves as the editor of the Open Location Services Specification and participated in the development of the CS-W, WMS, and WFS specifications. ESRI is active in ISO TC 211 and is playing a major role in the ISO metadata standards: ISO 19115 Metadata, ISO 19139 Metadata XML Schema Implementation, and ISO 19115-2 Metadata-Imagery Extensions. Many of these standards are directly related to GEOSS. ESRI staff chair or co-chair six of the OGC Working Groups or Revision Working Groups associated with these specifications. ESRI can facilitate feedback from the GEOSS proof-of-concept to ongoing portal, service, and metadata specification development and/or revision efforts.

Our current products have appropriate open application programming interfaces and support key data interchange formats and Web services standards for ensuring relevant GIS and IT interoperability between systems over wired and/or wireless networks.

In the last decade, ESRI launched a major initiative to re-architect its GIS product line to adhere to important, emerging IT and GIS standards. The resulting product, ArcGIS, is a scalable and modular family of software comprising a complete GIS. ArcGIS is founded

upon key interoperability and Web computing concepts and is in use today by tens of thousands of organizations that rely on GIS and IT interoperability.

For a detailed description of ESRI's standards and interoperability please see:

<http://www.esri.com/library/brochures/pdfs/standards-and-interoperability.pdf>

Many of the standards aforementioned are registered in the GEOSS Standards and Interoperability Registry. In particular the clearinghouse implements OGC CSW 2.0.2, OpenSearch and CSW 2.0.2 ISO AP (and related extensions such as INSPIRE) standards that are fundamental for properly supporting the GEOSS Common Infrastructure (http://earthobservations.org/gci_gci.shtml). With regards to service clients, the Geoviewer capabilities of consuming standard services guarantee the full exploitation of GEOSS resources.

Performance capability of the components

System performance is a function of an entire system and should not be measured against a specific GIS software application in isolation. System response times for tasks such as graphic data display, query and tracing operations, data processing operations, and even plotting and printing are difficult to estimate in a dynamic corporate environment, especially if the GIS interacts with other systems over a local or wide area network. System performance is a function of the following primary variables:

- Database design and size
- Client and Server hard disk performance
- Client graphics monitor performance
- Client and Server CPU processing ability and RAM availability
- Plotter/Printer processor and RAM availability
- Local and Wide Area (remote) network bandwidth availability and traffic load

Network performance can also vary depending on the work environments and habits of users. Individual workstation configurations, application functionality, and data structure complexity all have an impact on network performance. Simple data sets will improve system response times and performance; however, depending on user requirements, simple data sets cannot always be realized. Because these variables are beyond control or direct influence, ESRI cannot specify performance capability of the individual components upfront. However, all of ESRI's software systems are designed to take advantage of the latest advances in hardware operating systems and network technology in an effort to reduce these effects on system response time.

For over 15 years, ESRI has published its experiences and best practices in the System Design Strategies Whitepaper (<http://www.esri.com/library/whitepapers/pdfs/sysdesig.pdf>) and other whitepapers that are available for free from the ESRI website.

Availability of the components for participation in the Pilot

ESRI will continue to host an instance of the software that is part of the 'core capabilities' solution as described above on a server in the ESRI hosting environment. This environment will be monitored to support availability requirements during normal business hours at ESRI offices in Redlands, CA. The environment will be hosted through 2010. ESRI may consider extending the period of hosting the core capabilities solution at its own discretion.

We estimate the duration of the CFP Pilots to be approximately 6 months. ESRI will participate in the kick-off meeting scheduled for March 11-12. ESRI anticipates participating in weekly conference calls. In addition, ESRI will be ready to review architecture documents and contribute to the discussion on requirements and architecture for the GEOSS Architecture.

2.3 Architecture and Interoperability Arrangement Development

In order to support the refinement of the AIP architecture ESRI plans to contribute to the development of GEOSS best practices according to standards and the experience gained during the architecture implementation pilot.

ESRI is an active member of several standardization communities and interoperability organizations, including but not limited to the Open Geospatial Consortium and the International Standards Organization. ESRI actively participates in interoperability efforts through its research and development activities and particularly through initiatives set by OGC's Interoperability Program. Currently ESRI is participating at the Feature & Decision Fusion thread of the OGC OWS-7 test bed and can bring the experience on OpenSearch. In the fall of 2006, ESRI participated in the digital rights management track of the OGC OWS-4 test bed and ESRI successfully completed the development of the Kentucky Watershed Modeling Information Portal in close cooperation with OGC.

ESRI Professional Services has built and maintained good working relationships with many of the GEOSS members and partner organization, both in the United States and internationally.

3 Description of Responding Organization

3.1 General Description of ESRI

On any given day, more than a million people around the world use ESRI technology to improve the way their organizations conduct business.

ESRI develops and supports geographic information systems (GIS) at all levels, from the desktop to the enterprise. We provide software, educational services, user support, and consulting services ranging from needs assessments to system design and development. We are committed to producing excellent software and delivering exceptional services.

As Jack Dangermond, president of ESRI, explains, “We at ESRI believe that better information makes for better decisions. Our reputation is built on contributing our technical knowledge, special people, and valuable experience to the collection, analysis, and communication of geographic information.”

What We Provide

ESRI offers a complete range of GIS products and services including software, database design and development, custom applications programming, training, and installation.

We are the only GIS vendor that offers a complete geospatial solution—ArcGIS. The ArcGIS product suite is a complete system for authoring, serving, and using geographic information. You can use ArcGIS as an integrated collection of GIS software products for building and deploying a complete GIS wherever it is needed: on desktops, on servers, in the field, or over the Web.

For more than 25 years, we have built open and interoperable software products. We advocate open access to geographic data and software functionality through widely adopted, practical standards. Because we believe that the relationship between GIS technology and the rest of the IT infrastructure is crucial, our software tools support and integrate with virtually all commonly accepted standards. For you, this means compatibility and interoperability support with major enterprise systems such as enterprise resource planning, customer resource management, enterprise application integration, work management systems, and others.

We also offer sophisticated training, user support, and professional services to help you maximize your investment in ArcGIS. We provide training solutions for all budgets and schedules, and ESRI Support Services is available to answer any questions you have while using ESRI software. Our professional services team can also guide you through the entire GIS implementation process.

Why Choose GIS from ESRI?

More than 300,000 organizations worldwide use ESRI software, including most U.S. federal agencies and national mapping agencies, 45 of the top 50 petroleum companies, all 50 U.S. state health departments, most forestry companies, and many others in dozens of industries. The diversity of our customer base reflects three important facts.

Only ESRI Offers a Complete Geospatial Solution

ESRI is the only GIS vendor able to offer a complete enterprise geospatial solution. The success of our company is a direct result of the options we provide our customers in deploying GIS, from single desktop licenses to enterprise-wide solutions complete with Web services. Our GIS software allows you to:

- Access information through a full spectrum of clients from thick to thin, wired to wireless, standalone to embedded.
- Manage and utilize information from any standards-based file, database, or subscription service.

- Distribute your information to virtually any other system or device, through nearly any type of connection.
- Share data, workflows, and tools through Web services.

ESRI Supports Standards

Our GIS is a mature, open, and highly configurable technology that allows choices in hosting, development, and deployment. Our software supports all leading IT development and application environments as well as OGC and ISO GIS. The standards we support include spatial data formats (e.g. XML, GML) including translators, W3C and OASIS standards on Web Services, operating systems (including Windows, UNIX, and Linux), DBMSs (e.g. IBM DB2 Universal Database and Informix Dynamic Server, Oracle, and Microsoft SQL Server, including support for all spatial types), Network protocols and developer environments.

ESRI Is Dedicated to the User Community

The development and evolution of our GIS software hinges on the relationship ESRI maintains with its user community. By listening closely to the people who use our software every day, we routinely incorporate user feedback and recommendations in our product releases.

ESRI also provides a comprehensive suite of support options for our users, including standard telephone support as well as moderated discussion forums and a variety of regional and specialty user groups. ESRI hosts the largest GIS industry event in the world, publishes the two largest circulation periodicals in the industry, and operates the leading GIS book publisher.

Furthermore, ESRI continues to deliver the most sought-after training and consulting solutions in the GIS industry. These are all demonstrations of ESRI's commitment to you, the user of our software.

3.2 Programmatic and Technical Contact

Point of Contact:

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4 Additional Information

4.1 Disclaimer

In performance of this agreement, it is anticipated that no ESRI participant or sponsor will be responsible for delivery of the work proposed by other participants or sponsors. Provision of any data and/or software will be provided under the terms of the vendors' standard license agreement. The demonstration software and hardware provided will be for the duration of the pilot only, and remains the property of the contributing participant or sponsor.

4.2 Description of Components

Below is a detailed description of the components ESRI plans to make available for the AIP Phase 2 project.

4.2.1 ArcGIS Server

ArcGIS Server is a complete and integrated server-based geographic information system (GIS). It comes with COTS, end user applications and services for spatial data management, visualization, and spatial analysis. ArcGIS Server offers open access to extensive GIS capabilities that enable organizations to publish and share geographic data, maps, analyses, models, and more. With ArcGIS Server's rich standards-based platform, centrally managed, high-performance GIS applications and services can be accessed throughout an organization using browser-based, desktop, or mobile clients.

ArcGIS Server offers the following advantages: browser-based access to GIS; lower cost of ownership through centrally managed, focused GIS applications; integration with other enterprise systems; support for interoperability standards; and the ability to create custom applications and services for browser, desktop, mobile, Smart Client, and enterprise deployments using .NET or Java.

ArcGIS Server can be scaled to support both small workgroups and large enterprise configurations. ArcGIS Server Advanced Enterprise is designed for large organizations needing to share geographic data, maps, and analyses with the highest level of system flexibility and scalability. ArcGIS Server Advanced Enterprise can be implemented across a distributed computing environment and is designed to leverage various enterprise class database management systems.

ArcGIS Server Advanced Enterprise is designed for GIS organizations that want to provide a server-based GIS for distributing GIS services across the organization or over the Internet. It provides spatial data management, visualization (both 2D and 3D), and spatial analysis capabilities. Optional extensions to ArcGIS Server Advanced Enterprise are available for data interoperability (through custom data transformation procedures), network-based spatial analysis, spatial modeling, and three-dimensional modeling. Users

can connect via the Internet or intranet with a variety of clients including ArcGIS Desktop, ArcGIS Explorer, browser-based applications, and mobile devices.

4.2.2 ESRI ArcGIS Server Geoportal Extension

ESRI's ArcGIS Server Geoportal Extension is a combined technology and services solution for implementing local, regional, national, and global Spatial Data Infrastructure (SDI) portals. As the name identifies, the toolkit is essentially a software development kit for setting up geospatial metadata portals. The Geoportal incorporates advanced geography-based and term-based search capabilities. Geospatial information portals based on ESRI Geoportal technology has been used in support of Phase 1 of the GEOSS AIP (and Phase 2 (<http://geoss.esri.com>) and has been used for over 5 years to discover and access geospatial resources in National, State, and enterprise SDI.

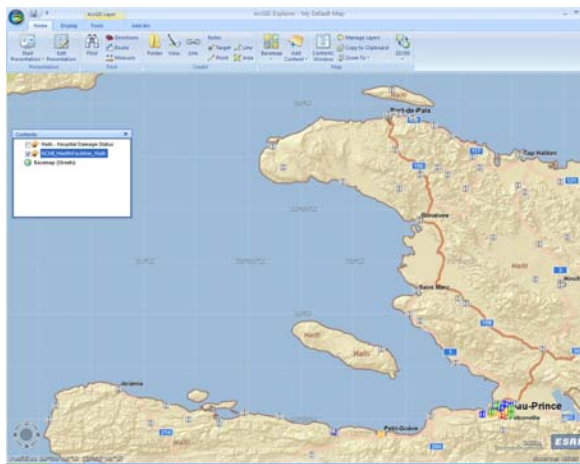
The latest version of Geoportal, version 9.3.1 SP1, was released at the end of December 2009. The suite of software modules with the GPT includes the following:

- A customizable portal module (the principal interface and capability for publishing, administering, and searching metadata).
- A map viewer for viewing and combining and querying map data discovered from within the GIS Portal. The Map Viewer supports OGC WMS, WFS, and WCS services.
- A desktop metadata "Harvesting Tool" for accessing original or updated metadata from participating metadata publishers for posting using the Portal module.
- Support for integrating with a content management system to support focused user communities (including but not limited to SBA).
- Data extraction service for downloading data for a resource, with the ability to specify an extent, projection and download format.
- CSW Clients, which are freely downloadable extensions for ArcMap and ArcGIS Explorer to enable searching CSW catalogs from within those environments
- WMC File Opener, which is a freely downloadable extension for opening saved web map context files in ArcMap

In addition to providing the ability to administer portal management functions and seamlessly communicate with data services that use a wide range of communication protocols, the GIS Portal Toolkit enables users to publish metadata in conformance with a variety of metadata standards, query metadata records for relevant data and services, and link directly to the online sites that host the data services referenced and described by the metadata. The GIS Portal Toolkit also enables those who implement it to establish user community communication capabilities, visualize referenced data as maps, and use referenced data in geographic queries and analyses.

4.2.3 ArcGIS Explorer

ArcGIS Explorer is a freely available lightweight desktop client for ArcGIS Server. It can be used to access, integrate, and utilize GIS services, geographic content, and other Web services. ArcGIS Explorer can also be used with a variety of other GIS services such as those published using ArcIMS, ArcWeb Services, Web Map Services (WMS), and other Web services. In addition, ArcGIS Explorer can use local data such as shapefiles, file geodatabases, JPEG 2000, GeoTIFF, MrSID, IMG, and other image formats.



ArcGIS Explorer integrates the rich world of GIS datasets and server-based geoprocessing applications. It does this by accessing the full GIS capabilities of ArcGIS Server including geoprocessing and 3D services.

With ArcGIS Explorer, you can:

- Fuse your local data with data and services from ArcGIS Server, ArcIMS, Open Geospatial Consortium WMS or KML, as well as ESRI-hosted services from ArcGIS Online.
- Perform GIS analysis using existing tasks (e.g., visibility, modeling, proximity search).
- Share the results of your analysis with ArcGIS Explorer with others.
- Use maps and data from your own secure servers.
- Consume GeoRSS feeds.

ArcGIS Explorer is available as part of ArcGIS Server 9.3. Users of ArcGIS Explorer can access the beta version of ArcGIS Online Services, which provides a series of ready-to-use online map services, globe services, and other GIS services.

4.2.4 ArcGIS Online

ArcGIS Online Services are a collection of 2D maps and 3D globes that can be accessed by ArcGIS Desktop and ArcGIS Explorer users via the Web. It includes satellite imagery for the world; a worldwide shaded relief map; and a seamless, multi-scale street map with highway data for the world and local street-level data for the United States and Canada as well as political world, physical world, world protected areas, and historical world globes and basemaps.

These maps and globes work directly with prebuilt tasks in ArcGIS Desktop, such as placefinder and gazetteer, and all the default ArcGIS Explorer tasks including Find Place,

Find Address, and Get Driving Directions. ArcGIS Online Services are deeply integrated with ArcGIS and provides immediate access to these cartographically designed, seamless globes and basemaps to which users can easily add their own data.

Users can embed ArcGIS Online Services content and tasks into their own maps and applications and share their results with others. Users save time since they can focus on their mission-critical work and not on creating basemaps, and they save money because they don't have to worry about data acquisition and maintenance. And since ArcGIS Online Services are hosted and powered by ESRI's ArcGIS Server, users don't have to make additional investments in hardware infrastructure or additional staffing to maintain data. ESRI updates the ArcGIS Online Services data content annually or semiannually so that users always have access to the most current data.

For more information please visit <http://resources.esri.com/arcgisonlineservices>

4.3 Relevant Experience

4.3.1 Spatial Data Infrastructures

Today, the concept of National Spatial Data Infrastructure has developed into a more sophisticated vision. The GSDI organization describes SDI as "a basis for spatial data discovery, evaluation, and application" which includes the following elements: geographic data, metadata, data models, services, clearinghouse, standards, and partnerships.

In Europe, INSPIRE identifies very similar high-level requirements for the European SDI: Metadata, Network services, Data and Service sharing, and Monitoring and reporting. INSPIRE also goes further to define the kinds of organizational roles and activities that are necessary to achieve regional and national SDI: Data and Service Provider, National Geoportals, a European Geoportal, and Domain applications.

Implicit in the SDI elements outlined by GSDI and INSPIRE is the concept of interoperability. It is a simple concept that all the data and services need to interoperate regardless of who or what is providing or consuming information. In practice, however, achieving true interoperability can sometimes be elusive due to interpretations of existing standards or use of immature specifications.

This is an area where ESRI's real world experience really shines. ESRI has been active with consulting and implementing SDI in all continents around the world. In the following section we outline some selected SDI consulting efforts describing their significance and ESRI's involvement.

4.3.2 Project examples

ESRI Global has been successfully assisting SDI / Geoportal development for more than 6 years. Following is a sampling of work performed by our SDI / Geoportal Services group in the last 3 years which demonstrates the depth and ability in providing consulting services regarding the development of SDI and geoportal solutions.

- **INSPIRE@EC project.** The ESRI Global SDI / Geoportal team is member of the consortium the Statistical Office of the European Communities (Eurostat) has awarded the INSPIRE@EC contract. The scope of the INSPIRE@EC project is to provide a productive INSPIRE-compliant, Web-based geographic information system (GIS) application that fulfills the European Commission's user requirements and expectations with a particular focus on fast response times. It includes the design and implementation of the INSPIRE@EC geoportal and its administrative tools as well as the creation of a registry for spatial data and services.
- **Geospatial One-stop portal.** The Geospatial One-Stop (GOS) portal in the United States (<http://gos2.geodata.gov/wps/portal/gos>) provides a one-stop ability to search for geospatial data from U.S. local, state, and federal government sources; Web mapping services; data collection activities; and geospatial best practices and standards. The portal is open and interoperable and incorporates industry-approved standards.
- **Mississippi geospatial clearinghouse.** The U.S. State of Mississippi Geospatial Clearinghouse (<http://www.gis.ms.gov/Portal/>) provides comprehensive access to GIS resources for Mississippi for use by government, academia, and the private sector and reduces the duplication of GIS efforts across the state. The portal also provides a central place to store and implement the Mississippi Digital Earth Model, which establishes a state digital land base that includes seven core data layers and will provide the basis for a uniform GIS in each county.
- **Kentucky Watershed Modeling.** The U.S. State of Kentucky Watershed Modeling Information Portal (KWMIP) is an OGC-compliant portal (<http://www.kwmip2.ky.gov/Portal/>) to support watershed modeling within the commonwealth. It provides a one-stop spot for all entities performing watershed modeling over the geography of Kentucky. KWMIP significantly leverages spatial data and tools already available or under construction in Kentucky as well as other Kentucky governmental data portals. The portal makes it easier and faster to find and model watershed data in the commonwealth and provides users with a greater range of GIS data and resources