



An Overview of ArcWebSM Services

An ESRI® White Paper • July 2004

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An Overview of ArcWeb Services

An ESRI White Paper

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An Overview of ArcWeb Services

What Are ArcWeb Services?

ArcWebSM Services offer a way to include geographic information system (GIS) content and capabilities in your applications without having to host the data or develop the services yourself. Through ESRI[®] ArcWeb Services, you can access and consume many types of geographic content including basemaps, business data, points of interest, and dynamic data such as traffic and weather information. ArcWeb Services can also provide geospatial functionality such as routing, mapping, geocoding/reverse geocoding, address matching, and place finding, all on top of leading commercial data sets. Often, the functionality is also held on the server side. That means you have a wide variety of highly scalable functionality and data that you can include in your applications without having to support or maintain that functionality and data. The result is significant savings of development time, expense, and computer resources.

Advantages of ArcWeb Services

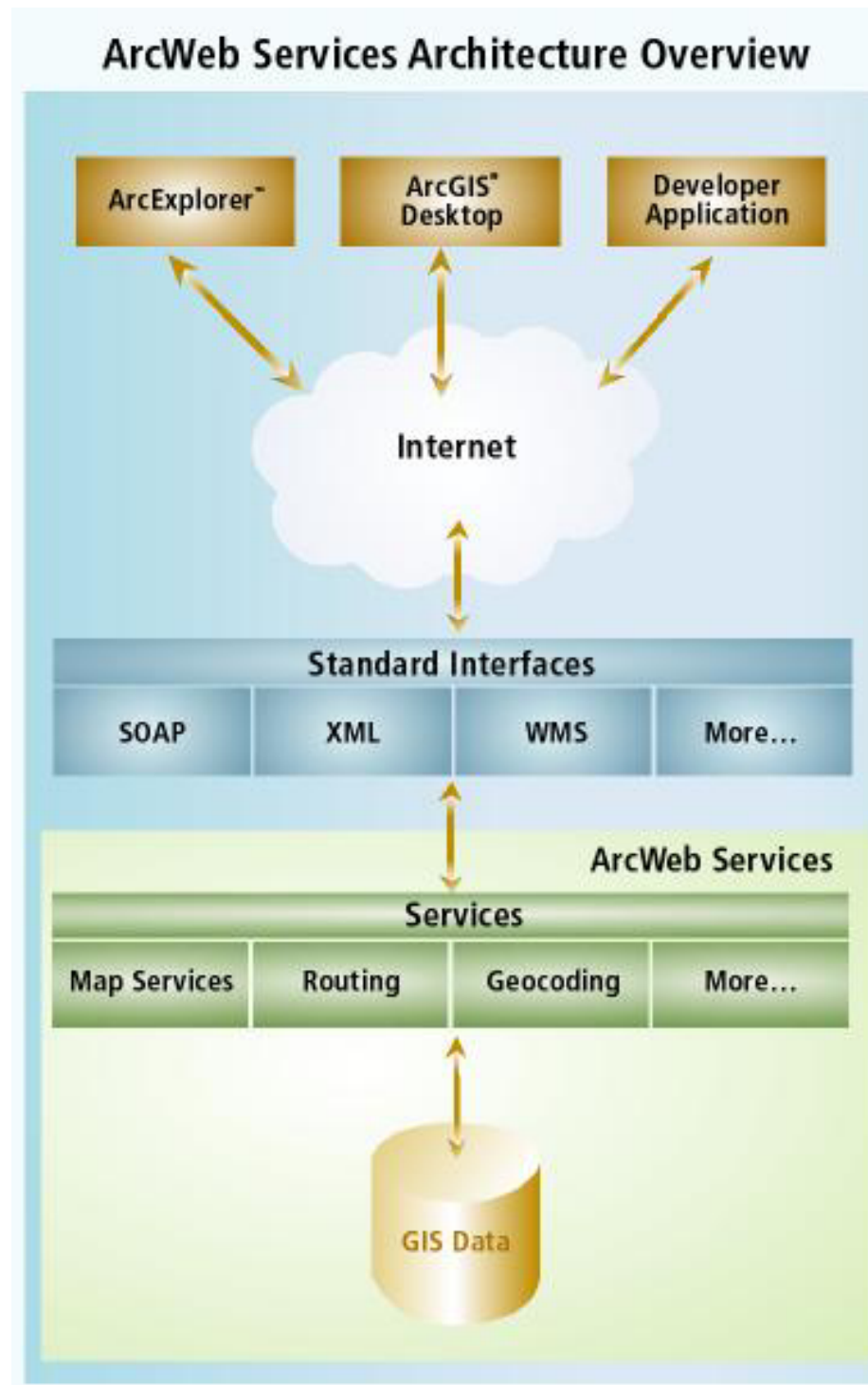
The key advantages of ArcWeb Services include the following:

- Access to vast amounts of current, reliable data and GIS capabilities without having to maintain or store the data
- Ability to combine multiple services and integrate them with your own application environment, leading to limitless possibilities for sharing geographic information
- No need to purchase hardware or software or hire additional staff
- No need to obtain updates to data sets because the data accessed via ArcWeb Services is always current
- Standards-based protocols
- 24/7 reliability

ArcWeb Services Customers

ArcWeb Services currently deliver approximately 1.5 million transactions each day to many world-class customers including the following:

- Homestore, Inc.
- National Geographic Society
- The Associated Press
- World Wildlife Fund
- National Park Service



**ESRI ArcWeb
Services
Infrastructure**

ArcWeb Services are based on an ESRI-hosted infrastructure designed to provide reliable 24/7 services. This infrastructure is powered by a variety of leading-edge technologies. The system hardware is provided by Sun Microsystems™ and includes numerous server-class machines that run the Web, mapping, and data servers. Two complete configurations are maintained at geographically separate locations to provide full system redundancy and load balancing. This robust, reliable system has the capability of delivering 5,000,000 maps per day above a 99.9 percent availability rate.

The ArcWeb Services system is monitored and maintained by ESRI staff on a 24/7 basis. ESRI staff is on-site during standard business hours (8:00 a.m. to 5:00 p.m., Pacific time) to perform any required system maintenance. ESRI staff is also available by pager during nonbusiness hours if there are system interruptions. If the system hardware, software, network, or applications fail to perform, ESRI systems staff is automatically notified by pager and will address the issue immediately. ESRI has high-level support agreements with our hardware and network vendors that guarantee prompt response, if necessary.

**ESRI Internet
Technology**

ArcWeb Services combine the power and spatial processing capabilities of ArcIMS®, ArcSDE®, and leading third party technologies with a spatial data repository maintained by ESRI. For further information on ArcIMS and ArcSDE, refer to the product sections of the ESRI Web site at www.esri.com/software.

ArcSDE is a server software product used to access large multiuser geographic databases stored in database management systems (DBMSs). Its primary role is to act as the GIS gateway to spatial data stored in a DBMS.

ArcIMS is the solution for delivering dynamic maps and GIS data and services over the Web. It performs basic spatial functions such as geocoding, reverse geocoding, spatial searching, and mapping. ArcIMS is composed of a multitier, highly scalable architecture consisting of Web server connectors, an application server, a spatial processing server, and a suite of open Extensible Markup Language (XML) application program interfaces (APIs) that allow the application developer community to easily and quickly develop compelling location-based applications.

ArcIMS and ArcSDE were developed to work together as an integrated back-office solution for fast Internet or Intranet access to vector, raster, and survey data stored in a relational database. ArcSDE also works as an application server, delivering spatial data to many kinds of applications and serving spatial data across the Web and wireless Web.

What Is Included in ArcWeb Services?

ArcWeb Services consist of a vast collection of data from the world's leading commercial data publishers as well as a set of robust services that allow you to perform a variety of functions on the accessed data.

Data

ArcWeb Services give you access to terabytes of data including street maps, live weather maps, digital orthophoto quarter quadrangles, topographic maps, live traffic information, shaded relief imagery, flood data, and census data. ESRI is continuously adding to a lengthy list of data providers that includes Geographic Data Technology, Tele Atlas, Meteorlogix, GlobeXplorer, Pixxures, National Geographic, ESRI Business Information Solutions (ESRI BIS™), TrafficCast, and many more. For a complete list of the data included in ArcWeb Services, visit <http://www.esri.com/software/arcwebservices/about/data.html>.

Services

ArcWeb Services offer the following functionality:

- Generating a dynamic map of a specific location
- Determining the location of a place (e.g., city, river) anywhere in the world
- Determining the location of street addresses in North America, Europe, and New Zealand
- Generating a route with driving directions for multiple locations
- Determining the characteristics (e.g., population, flood potential) of a location
- Uploading custom points of interest for use in maps and proximity searches
- Finding the nearest points of interest using user-specified parameters

Developers also have access to a batch geocoder, a projection service, a report service, an account information service, and a point of interest (POI) Simple Object Access Protocol (SOAP) service.

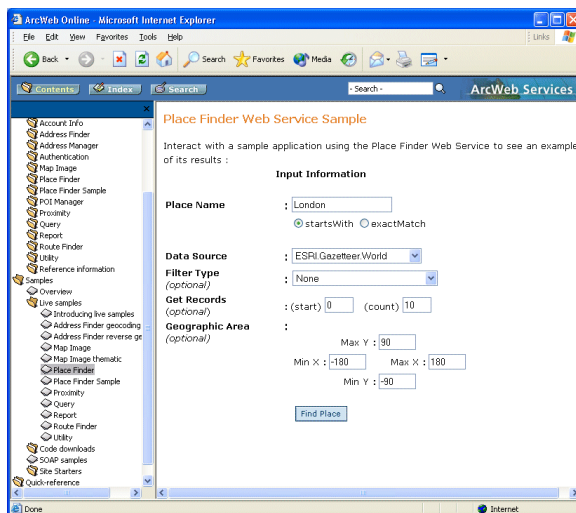
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Examples of ArcWeb Services

Each of the services included in ArcWeb Services offers specific GIS capabilities that can be used alone or in combination with other services and Web application tools. The main capabilities of each service are listed below. For detailed information about each service, see <http://arcweb.esri.com/arcwebonline/index.htm>.

Place Finder Web Service

- Input place name.
- Constrain search by geographic area.
- Constrain search by place type.
- Define the number of records to return.
- Filter by country.
- Define the type of search.

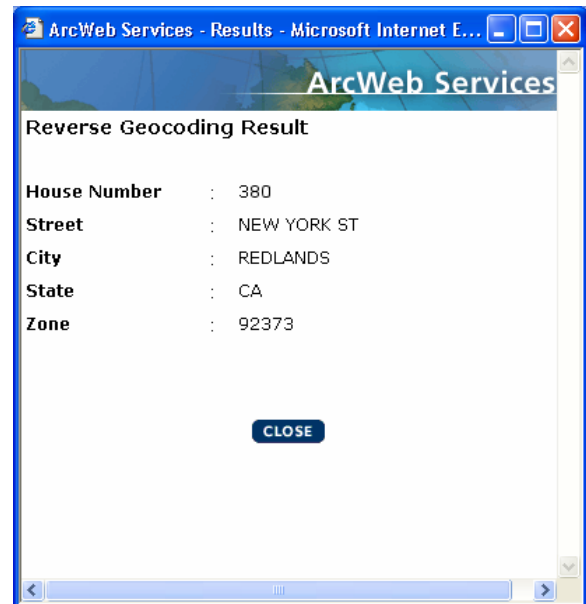
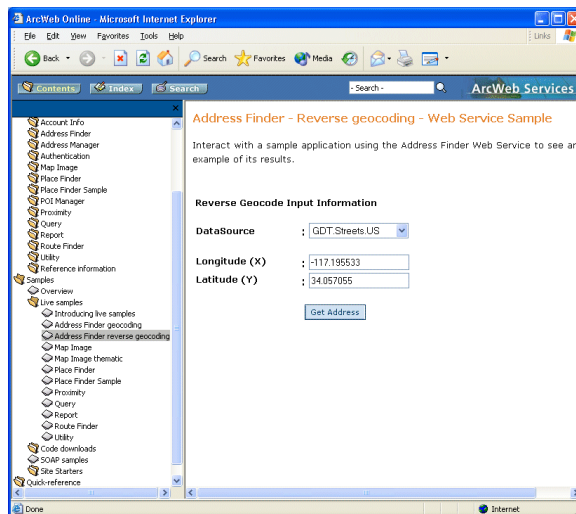
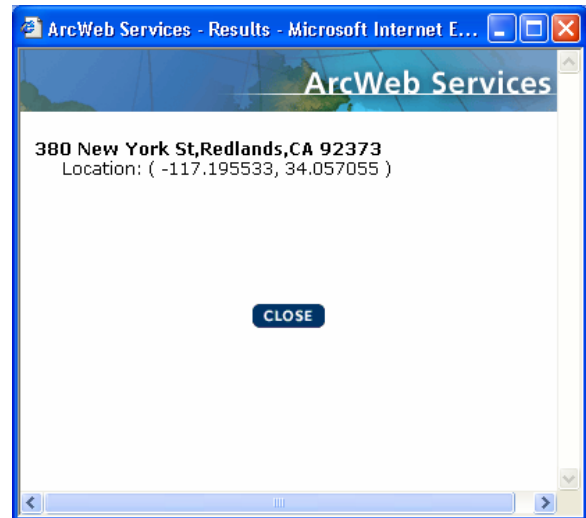
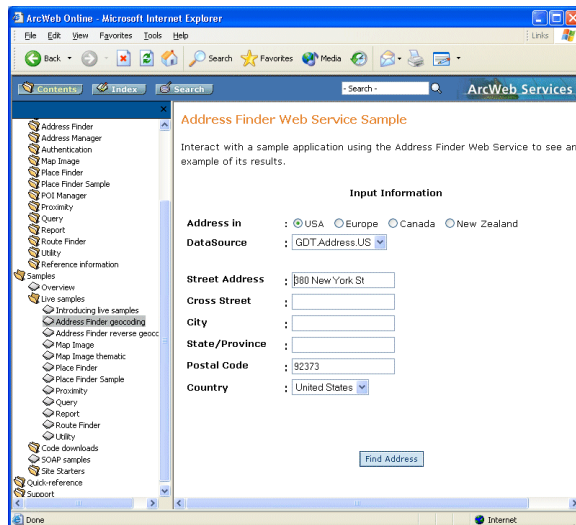


Example of the Place Finder Web Service



Address Finder Web Service

- Input street address or partial address (number, street name, cross street, city, state/province, postal code).
- Perform reverse geocoding (transform a coordinate location into a street address).

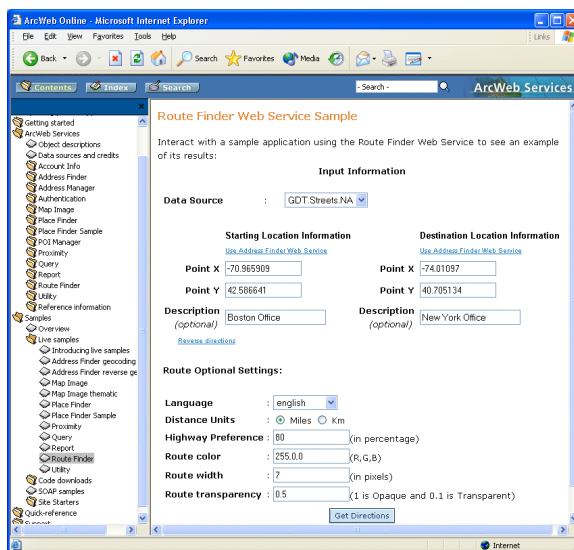


Examples of the Address Finder Web Service—Geocoding and Reverse Geocoding

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Route Finder Web Service

- Specify a list of coordinate pairs for the start point, endpoint, and midpoints of a route.
- Input a description of points along a route.
- Choose whether the route is given using textual driving directions, map images, geometry, or a combination of the above.
- Optimize the route as shortest or quickest (along with a ranking of highway preferences).
- Support multilingual directions (French, Italian, Dutch, Swedish, German, Portuguese, English, Spanish, Danish, and Norwegian).

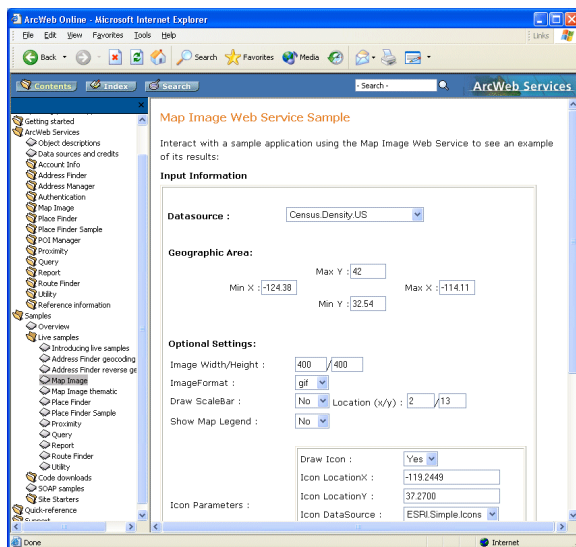


Example of the Route Finder Web Service

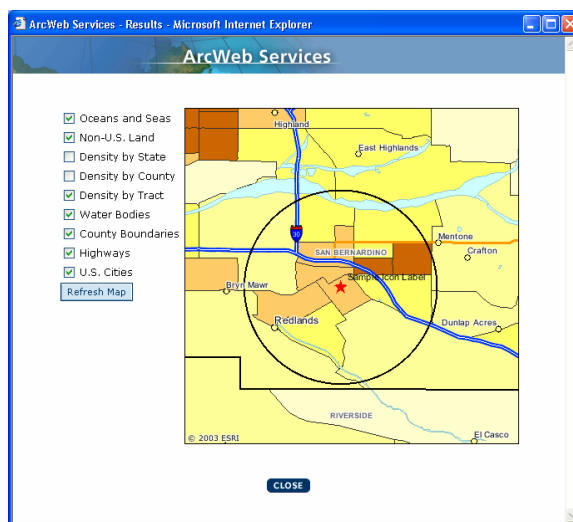


Map Image Web Service

- Generate map image for specified geographic area.
- Generate thematic map image based on ESRI demographic variables or user-defined values.
- Generate a map style for a particular data source.
- Specify image type (e.g., GIF).
- Specify size.
- Specify projection.
- Specify background color.
- Display scale bar.
- Display user-provided icons with labels through [POI Manager Service](#).
- Display circles, lines, and polygons.
- Determine coordinate for map click.



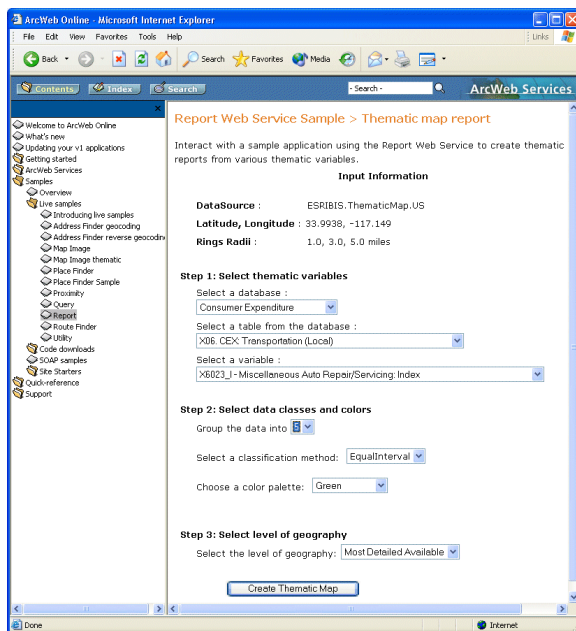
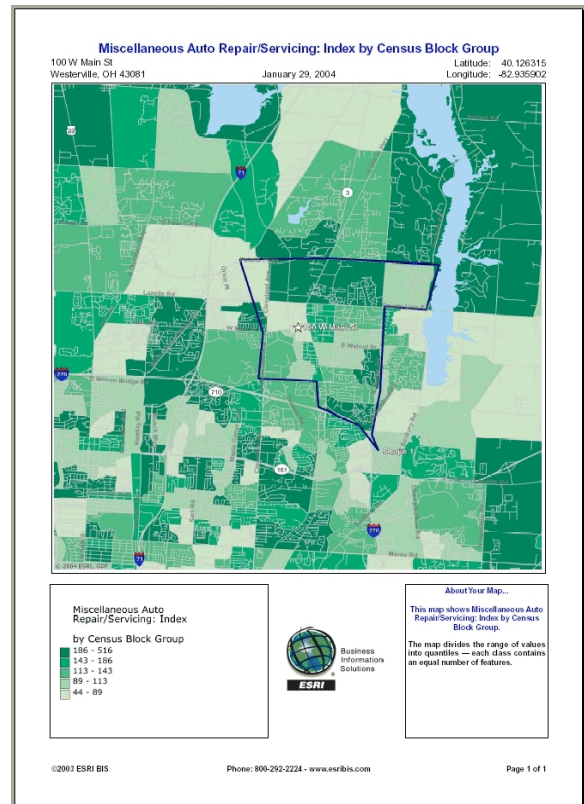
Example of the Map Image Web Service



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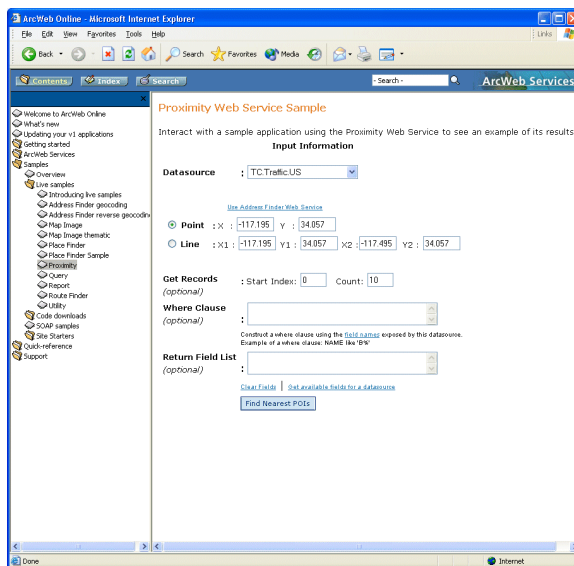
Report Web Service

- Define up to three areas to analyze per report.
- Define up to three areas using rings around a coordinate.
- Define an area by a list of counties, ZIP Codes, or census tracts.
- Define an area by user-defined polygons.
- Customize the subtitle, site/area information, and other header information.
- Get the aggregated data results in PDF, Excel, or XML format.
- Create a map in PDF format that contains 300 dpi images and prints as a presentation quality document.

*Example of the Report Web Service*

Proximity Web Service

- Find the nearest point features.
- Find the features within a specified radius.
- Return a list of found features and related information.
- Limit searches based on user-specified criteria.

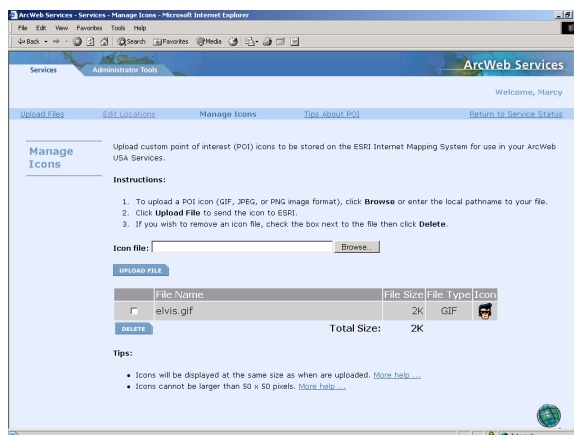


Example of the Proximity Web Service

| CITY | CROSSSTREET1 | CROSSSTREET2 | DESCRIPTION |
|-------------|----------------|-----------------|--|
| Los Angeles | 5TH ST | N/A | Traffic Hazard |
| Los Angeles | DAY ST | N/A | Disabled Vehicle |
| Los Angeles | EUCALYPTUS AVE | N/A | Disabled Vehicle |
| Los Angeles | LA CADENA DR | N/A | Traffic Collision |
| Los Angeles | MARKET ST | N/A | Disabled Vehicle |
| Los Angeles | CACTUS AVE | N/A | Wrong Way Driver |
| Los Angeles | MILLIKEN AVE | N/A | Traffic Hazard |
| Los Angeles | S Grove Ave | S Archibald Ave | Average driving speed below 45 mph |
| Los Angeles | Garfield AVE | Pomona FWY | Type: OnRamp, Lanes Closed: All, Total Lanes: 2 |
| Los Angeles | Garfield AVE | I-710 | Type: Mainline, Lanes Closed: #5, Total Lanes: 5 |

POI Manager Web Service

- Upload a set of locations or addresses to ESRI as a database file and store them in a table.
- Add, edit, or delete locations in a table through a Web interface or SOAP.
- Upload personal icons to be used on maps.



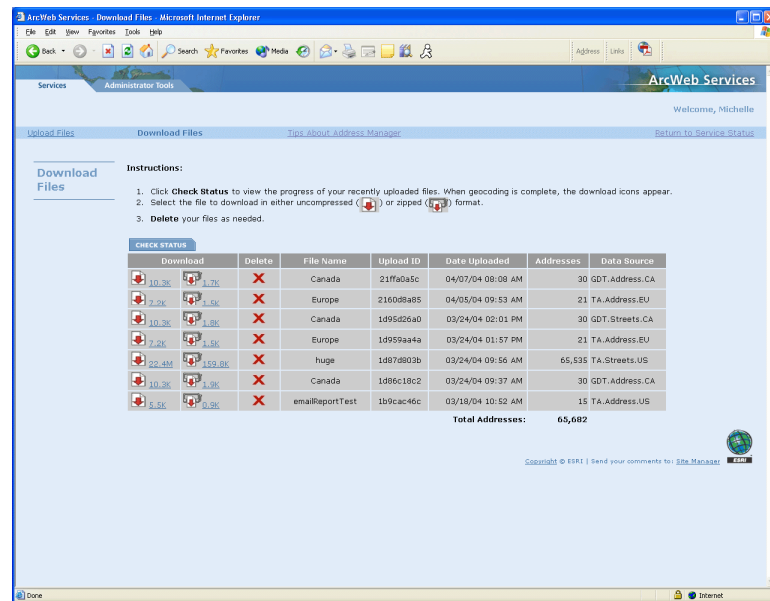
Example of the POI Manager Web Service

| Delete | Name | Street | City | State | ZIP | Country | Long |
|--------------------------|------------|---------------------------|------------|-------|-------|---------|-----------|
| <input type="checkbox"/> | Alaska | P.O. Box 230196 | Anchorage | AK | 99523 | USA | -149.8356 |
| <input type="checkbox"/> | Atlanta | 11465 Johns Creek Pkwy | Duluth | GA | 30097 | USA | -84.1672 |
| <input type="checkbox"/> | Boston | 180 Conlier Hill Dr Ste 3 | Danvers | MA | 01923 | USA | -70.9659 |
| <input type="checkbox"/> | California | 388 New York St | Pasadena | CA | 92373 | USA | -117.1955 |
| <input type="checkbox"/> | Charlotte | 3325 Spring Brook Ln St | Charlotte | NC | 28226 | USA | -80.7829 |
| <input type="checkbox"/> | Chicago | 221 N La Salle St Ste 61 | Chicago | IL | 60601 | USA | -87.6322 |
| <input type="checkbox"/> | Columbus | 64 Granville St Ste 201 | Gahanna | OH | 43230 | USA | -82.8787 |
| <input type="checkbox"/> | Dallas | 1282 Richardson Dr Ste | Richardson | TX | 75080 | USA | -96.7277 |
| <input type="checkbox"/> | Denver | 1 International Ct | Broomfield | CO | 80021 | USA | -105.1153 |

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Address Manager Web Service

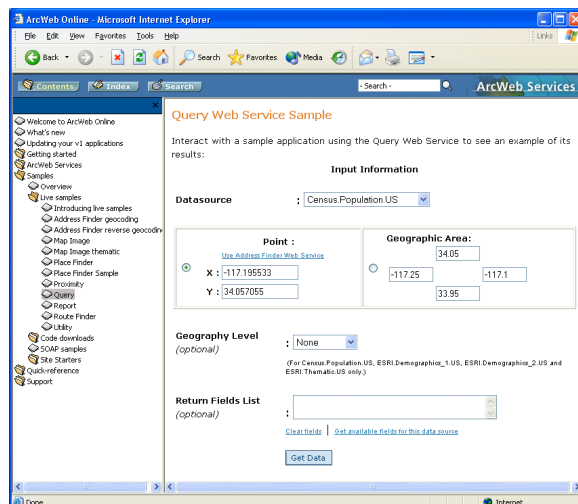
- Upload a set of street addresses through a SOAP or Web interface.
- Receive geocoded locations for the set of points for storage on a local system.



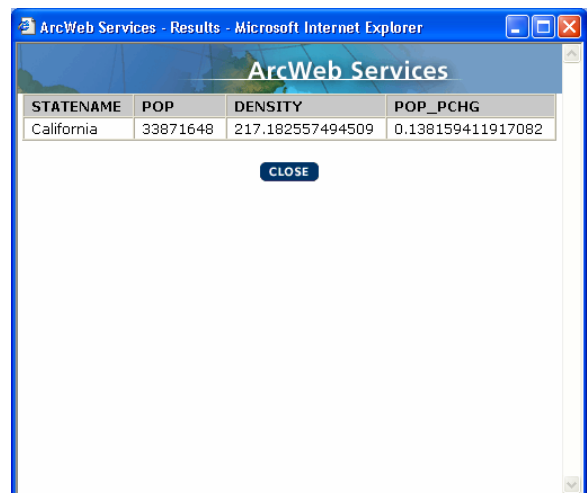
Example of the Address Manager Web Service

Query Web Service

- Determine which attributes are available to query.
- Specify the level of geography for the query.
- Generate a list of attributes or field names and their descriptions for a point area, envelope, or geometric region.

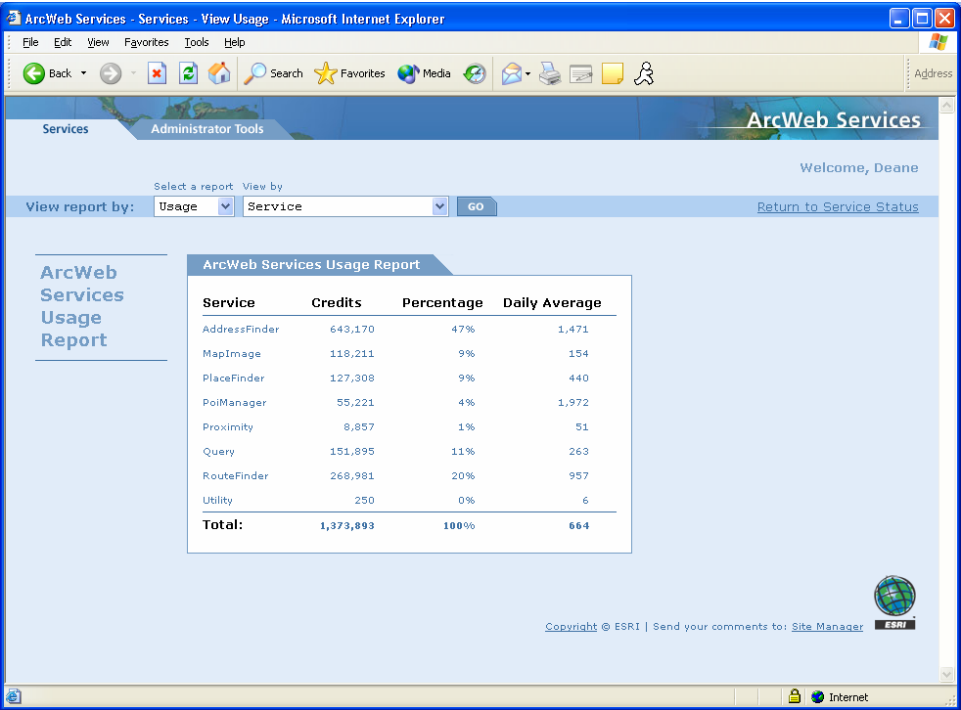


Example of the Query Web Service



Account Info Web Service

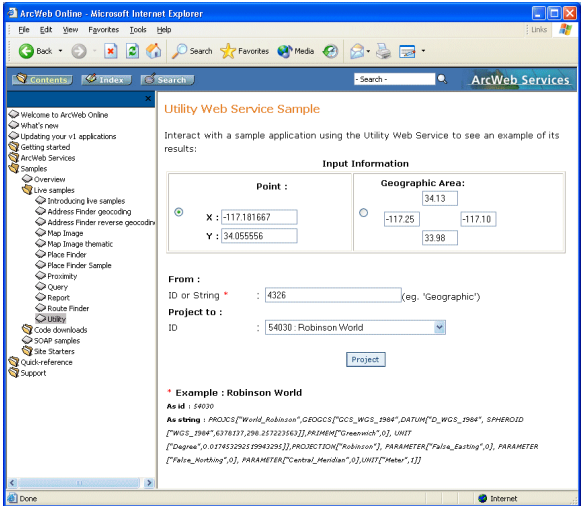
- Track your usage of ArcWeb Services and data sources.
- View remaining credits.
- Access account information through a Web interface or SOAP.



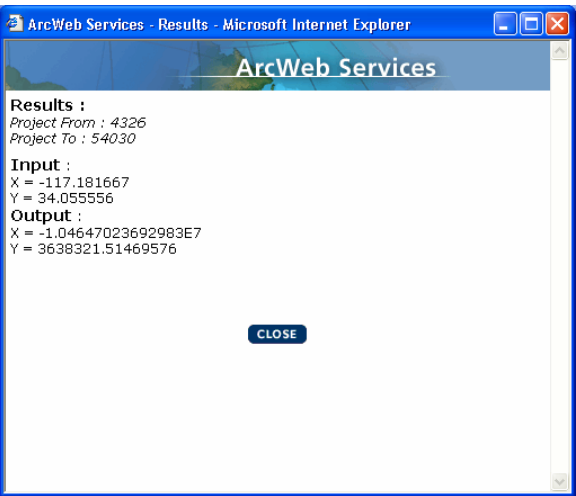
Example of the Account Info Web Service

Utility Web Service

- Change coordinate system and/or datum transformation for point, polyline, polygon, or envelope.



Example of the Utility Service



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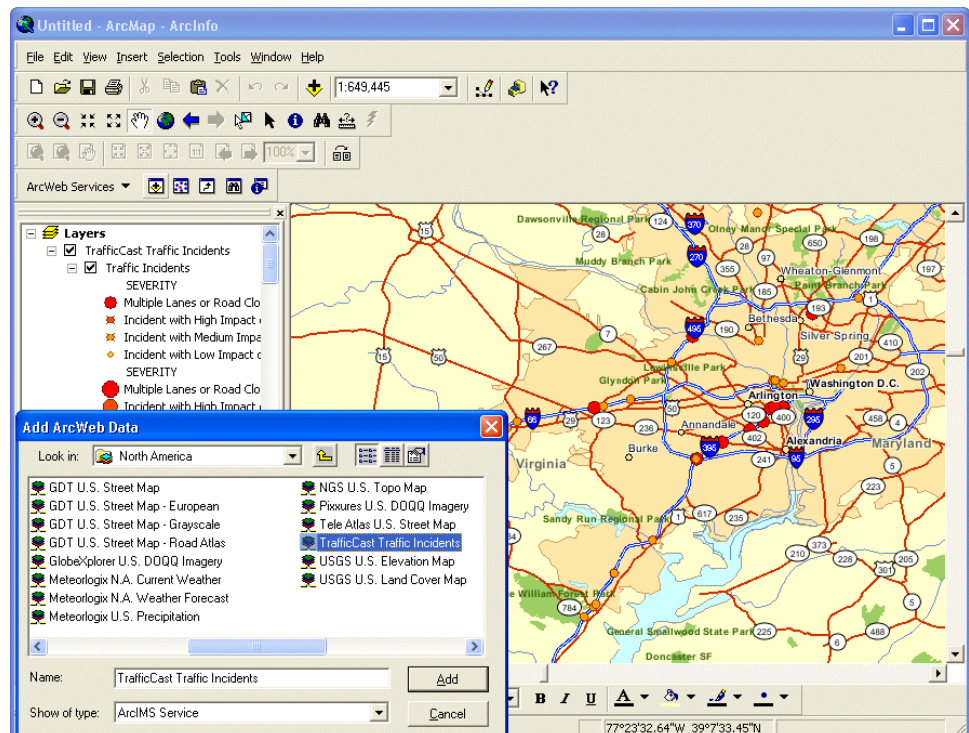
Accessing ArcWeb Services as a Developer

Developers can deploy ArcWeb Services through standard Web protocols and languages including HTTP and XML. ArcWeb Services use the XML-based SOAP to communicate and, therefore, are compatible with the majority of Web services frameworks available today such as Microsoft's .NET or webMethods' Glue. You do not have to learn new programming languages or environments to use ArcWeb Services, so you can get up and running quickly. The ArcWeb Services APIs are fully documented and the help system includes method and object descriptions, tutorials, code samples, and live client samples. For more information on using ArcWeb Services as a developer, see <http://arcweb.esri.com/arcwebonline/index.htm>.

Accessing ArcWeb Services as an ArcGIS User

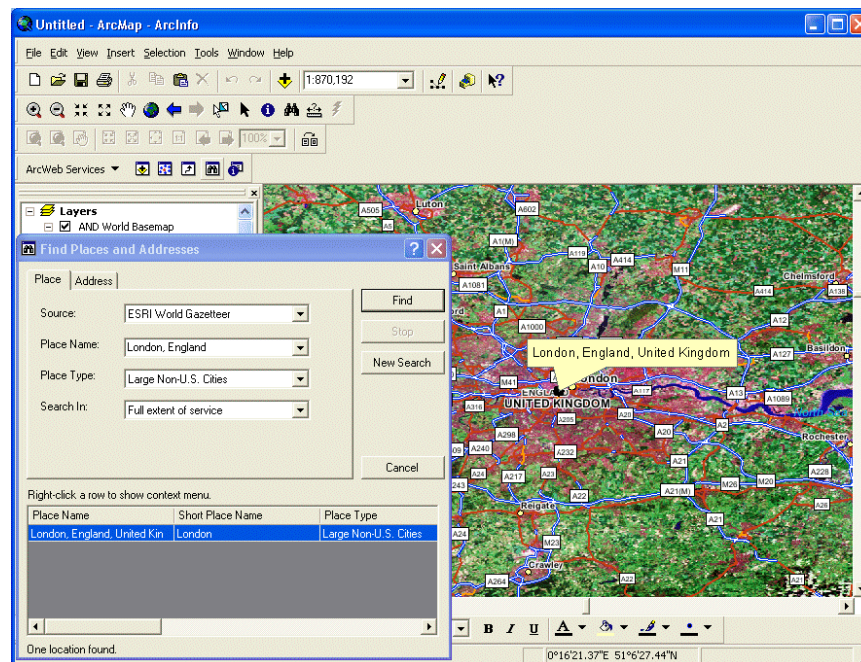
The ArcWeb toolbar lets ArcGIS Desktop (ArcView®, ArcEditor™, ArcInfo™) users access data and functionality offered by ArcWeb Services. These tools provide ArcGIS® users easy access to the functionality of Web services while maintaining the features of the ArcGIS Desktop ArcMap™ application, including the display and query of maps, creation of publication-quality hard copies, and performance of many other map-based tasks. ArcGIS Desktop users who subscribe to ArcWeb Services gain access to high-quality data and a variety of functionality, including the ability to

- Display content rich maps.



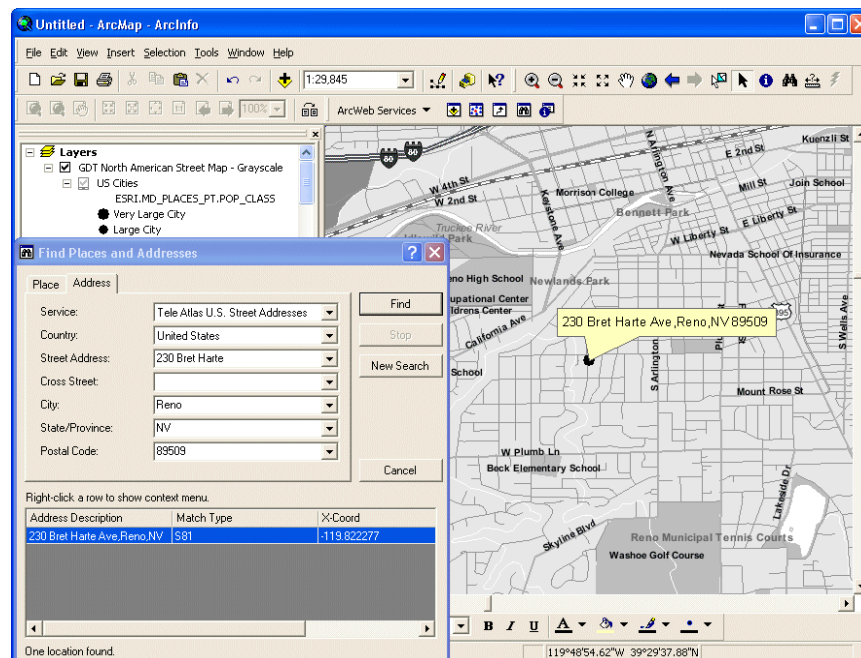
Example of the ArcWeb Add Data Tool in ArcGIS Desktop

- Find named places and display them on a map.



Example of the ArcWeb Find Places and Addresses Tool in ArcGIS Desktop

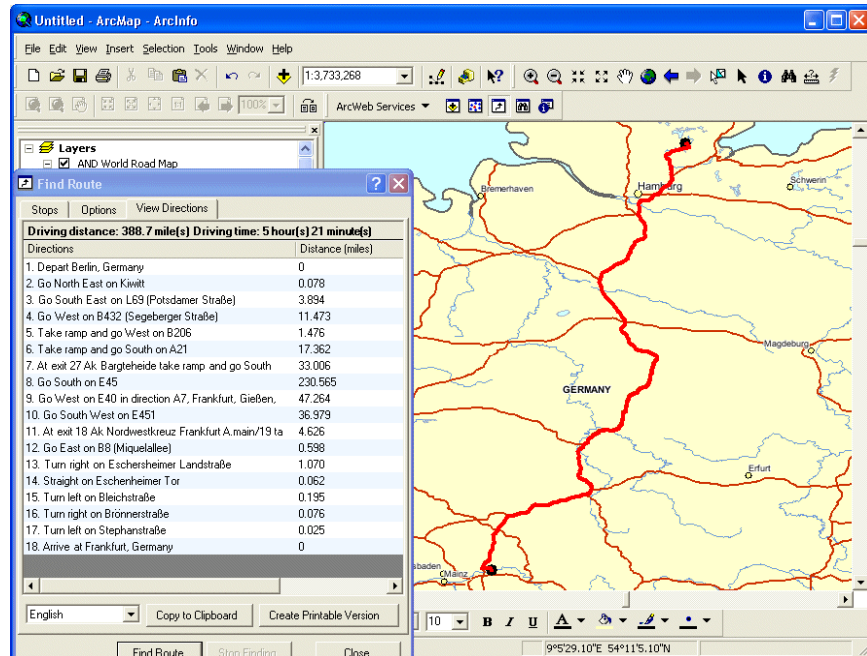
- Find addresses and display them on a map.



Example of the ArcWeb Find Places and Addresses Tool in ArcGIS Desktop

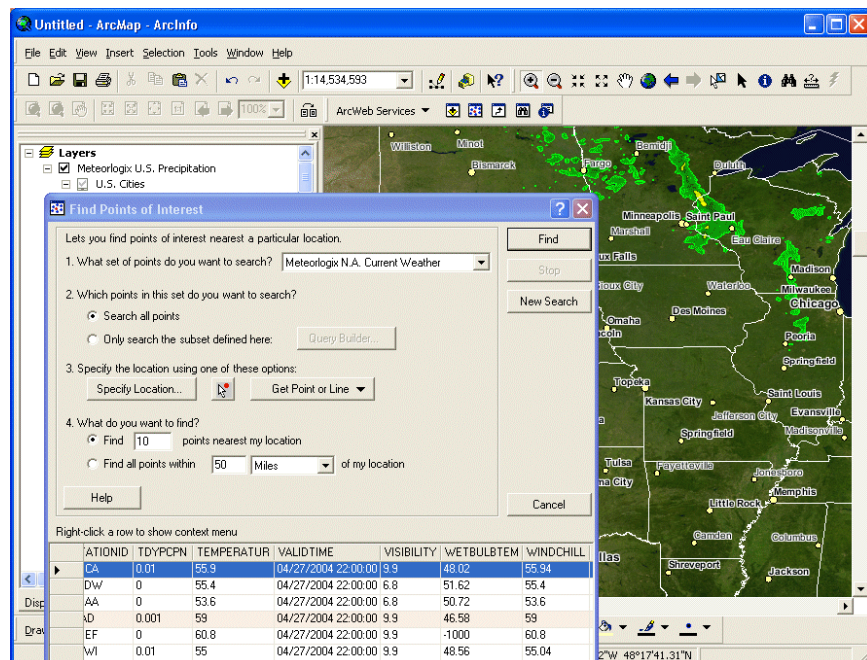
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- Find a route between two or more stops, display it on a map, and get driving directions.



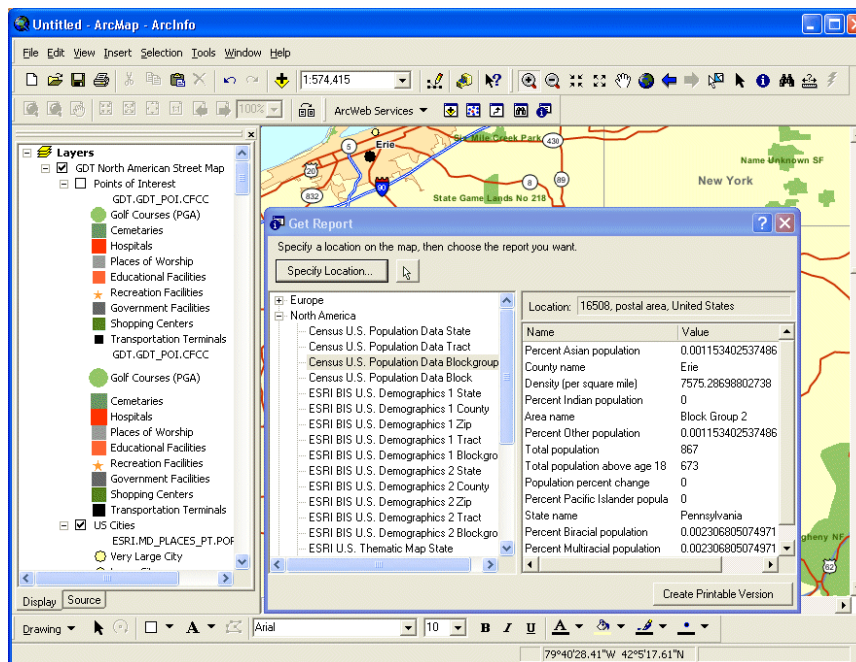
Example of the ArcWeb Find Route Tool in ArcGIS Desktop

- Locate POIs using different proximity parameters.



Example of the ArcWeb Find Points of Interest Tool in ArcGIS Desktop

- Query to determine information provided by ArcWeb Services.



Example of the ArcWeb Get Report Tool in ArcGIS Desktop

ArcWeb Solutions

For end users who want rapid and easy access to maps and geographic-based reports, ESRI offers solutions that have been built using ArcWeb Services. These solutions provide up-to-date geographic-based reports and maps that you can access through a subscription service or download.

ArcWeb Services solutions now offered by ESRI include

- **MapShop for Homeland Security**—Provides emergency and crisis management centers with the ability to create a common operating picture and access detailed data for a specific event.
- **MapShop for Media**—Designed for media outlets, MapShop for Media is an affordable and easy way to create maps of any location in the world. Maps created with MapShop for Media can be edited in typical illustration software.
- **Business Analyst Online**—Combines GIS technology with extensive business, demographic, and consumer household data to deliver Web capabilities previously available only through ESRI's ArcGIS Business Analyst desktop software.
- **Flood Map Report**—Allows users to download a Flood Map Report to help determine the relative flood risk of a specific location. These reports are created using Federal Emergency Management Agency Q3 Flood Data and GDT Dynamap/2000 street data.

For more information on ESRI's ArcWeb Services solutions, visit www.esri.com/software/arcwebservices/about/focused-solutions.html.



For more than 30 years ESRI has been helping people manage and analyze geographic information. ESRI offers a framework for implementing GIS technology in any organization with a seamless link from personal GIS on the desktop to enterprisewide GIS client/server and data management systems. ESRI GIS solutions are flexible and can be customized to meet the needs of our users. ESRI is a full-service GIS company, ready to help you begin, grow, and build success with GIS.

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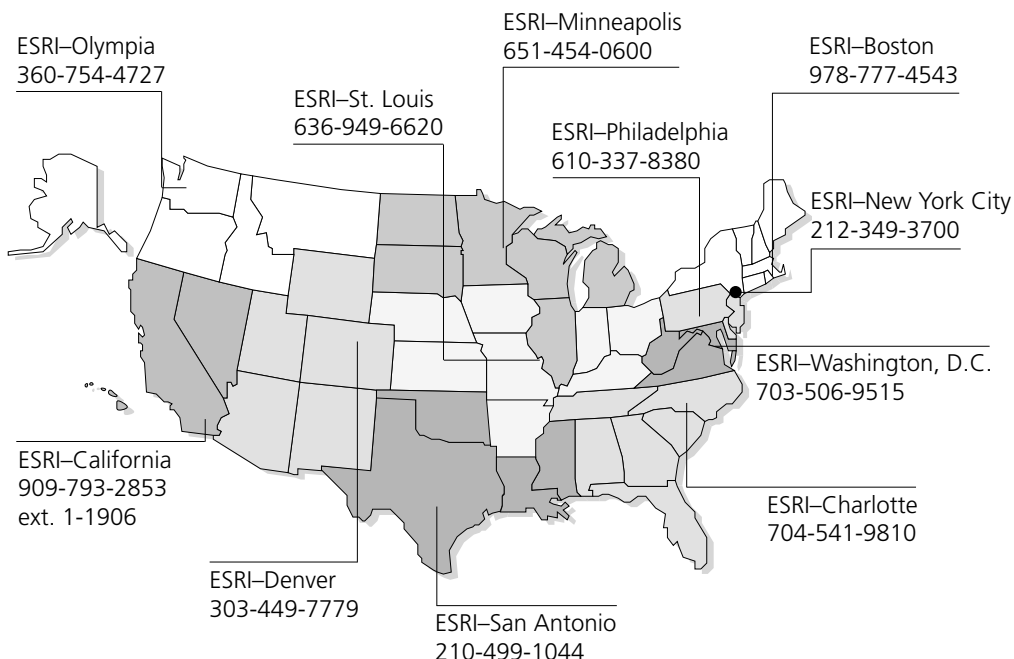
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