What is ArcGIS Desktop?

ArcGIS Desktop is the primary product used by GIS professionals to compile, use, and manage geographic information. It includes comprehensive professional GIS applications that support a number of GIS tasks, including mapping, data compilation, analysis, geodatabase management, and geographic information sharing.

ArcGIS Desktop is the platform that GIS professionals use to manage their GIS workflows and projects and to build data, maps, models, and applications. It's the starting point and the foundation for deploying GIS across organizations and onto the Web.

Desktop applications and shared documents

ArcGIS Desktop includes a suite of applications—ArcMap, ArcCatalog, ArcGlobe, ArcScene, ArcToolbox, and ModelBuilder. Using these applications and interfaces, you can perform any GIS tasks from simple to advanced.

In ArcGIS Desktop, you apply these applications to create and work with a number of different types of geographic information. For example, you create and work with map documents in the ArcMap application, globe documents in the ArcGlobe application, and geoprocessing models in the ModelBuilder application.

As you use ArcGIS Desktop, you will work with a number of elements of GIS information, such as the following:

- Map documents, globe documents, and layers
- Geodatabases
- Geoprocessing toolboxes
- Other data files such as imagery

What users do with Desktop

ArcGIS Desktop users perform a wide variety of GIS work from simple mapping and data compilation to advanced spatial analysis. They use Desktop for 3D GIS, to compile, manage, and maintain multiuser enterprise geodatabases, to perform spatial analysis, to manage imagery and do advanced image processing, and to automate many GIS procedures within their organizations.

Three key tasks are performed by most users including working with maps, spatial analysis, and data compilation. **Maps** are critical in Desktop because they bring all information to life and are the mechanism used for editing and for delivering spatial analysis to many users. The comprehensive map capabilities that are part of Desktop are also used for virtually any professional mapping activity. For example, see the online Mapping Center to learn more about cartography with ArcGIS.

Maps also provide the basis for editing and data compilation work. ArcMap is the primary application used for advanced data compilation and is used across hundreds of thousands of organizations to compile rich authoritative content for their application domains and areas of interest. These rich data provide the basis for many GIS applications, and much of this information is available online for the ArcGIS community.

Spatial analysis is one of the more interesting and remarkable aspects of GIS. Using spatial analysis, GIS users can combine information from many independent sources and derive an entirely new set of information (results) by applying a large, rich, and sophisticated set of spatial operators. GIS professionals use Geoprocessing to "program their own ideas" in order to derive these analytical results. In turn, the results are applied to a wide variety of problems.

A critical role for ArcGIS Desktop users

Many ArcGIS Desktop users have a special role and responsibility to provide high-quality maps and geographic information to others in their organizations and on the Web. They do this by creating and sharing maps, layers, geodatabases, imagery, and analytic models.

ArcGIS Desktop is used to create geographic information, which can be shared and served to a range of clients. Serving is accomplished using ArcGIS Server.

ArcGIS documents encapsulate your GIS work for sharing

Maps, geodatabases, and geoprocessing tools are the elements that capture how GIS is used. They define the primary aspects of ArcGIS implementation—from visualization, symbolization, and editing to reporting and analysis. ArcGIS maps (both 2D and 3D) help to bring this information to life.

By creating maps and layers as part of this work, you as an ArcGIS Desktop GIS user can encapsulate all of the aspects for how geographic information is displayed, used, queried, managed, and analyzed. This is the basis for sharing your work with other desktop GIS users and, more broadly, on the Web. For example:

- You can double-click to open and work with map documents in ArcMap and globe documents in ArcGlobe. These maps can be shared as a map package.
- You can work with geoprocessing models in ModelBuilder. In addition, you can write model scripts using Python. The models and scripts that you create are managed and shared using toolboxes.

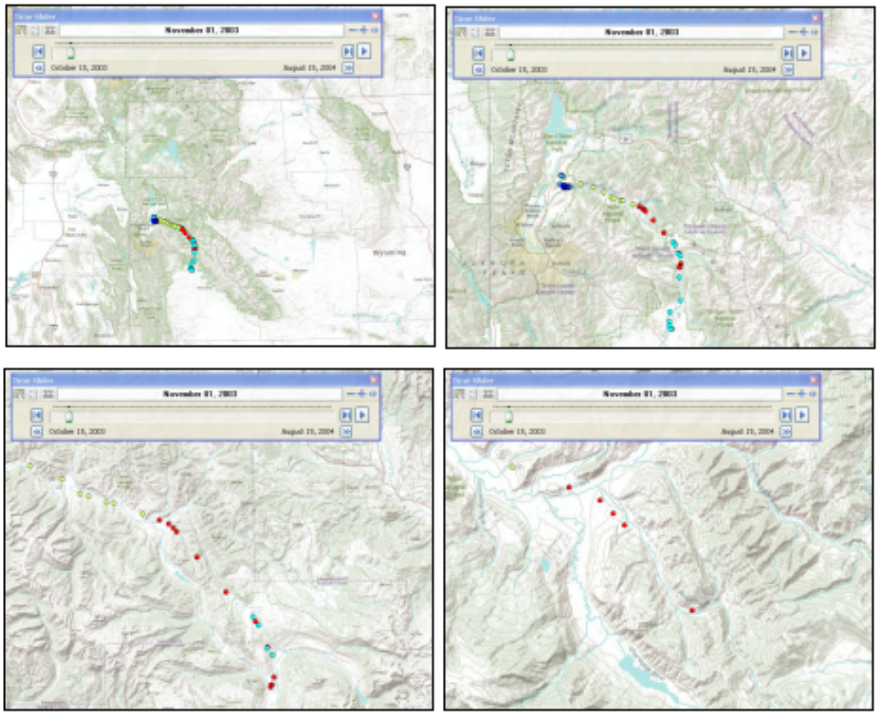
When you download such a package from another user (for example, a map package), ArcGIS Desktop is **transformed** by the package—it can do all the same work that the original user had designed and built into the shared document.

Working with maps in ArcGIS Desktop

A common pattern for building an interactive map is to combine a series of operational map layers that overlay onto a basemap (such as imagery, terrain, street map, or topography). Basemaps are typically designed to work across a range of map scales. Each operational map layer represents a logical collection of information such as streets, land use, and hydrology.

GIS maps contain tools for interacting and working with the map contents (in other words, the geographic information behind each layer as well as analytic functions that can be used to derive new information). For example, you can use GIS maps for the following:

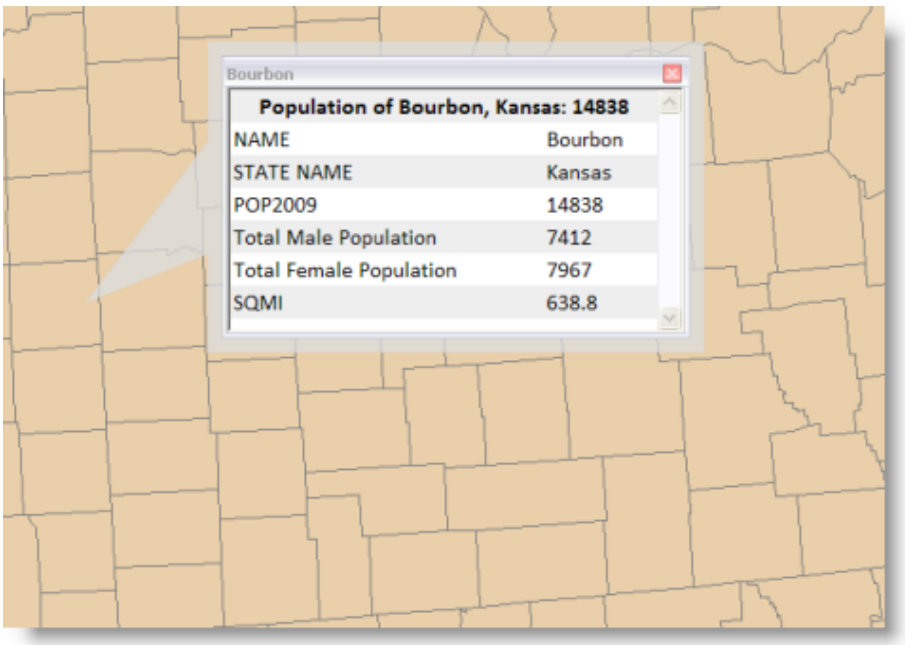
Multiscale map display for pan and zoom



This series of screen shots illustrates zooming in on animal tracks. This basemap is built to support interactive, multiscale map display.

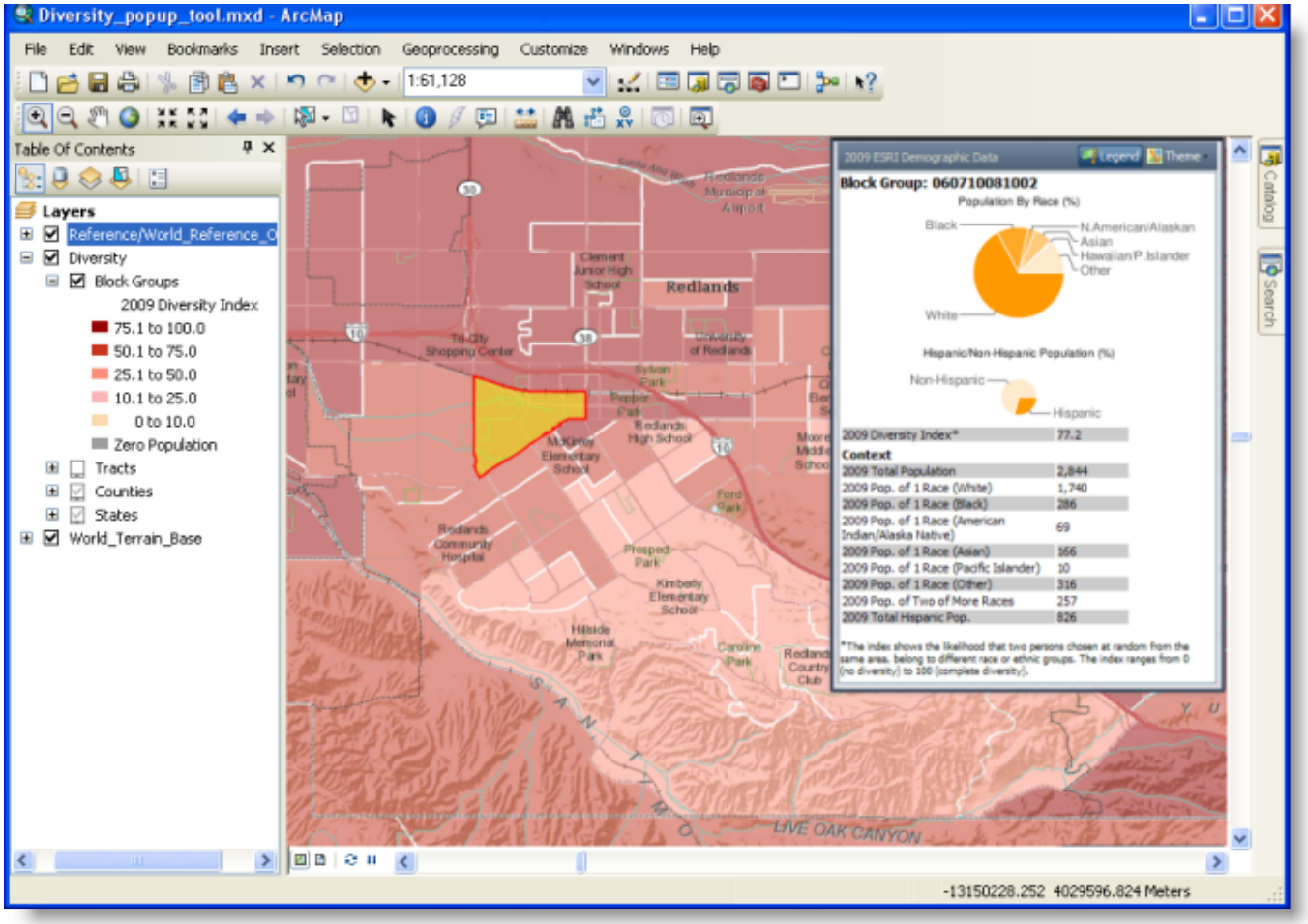
To generate simple information reports

Interactive feature reporting for the simplest (and most efficient) map layers can use simple attribute field pop-ups.



Each layer has various attribute fields that you can view. As the map author, you define the list of visible fields, hidden fields (for example, do you really need to show a feature's ObjectID?), and the alias names (captions) that appear for each field in information pop-ups.

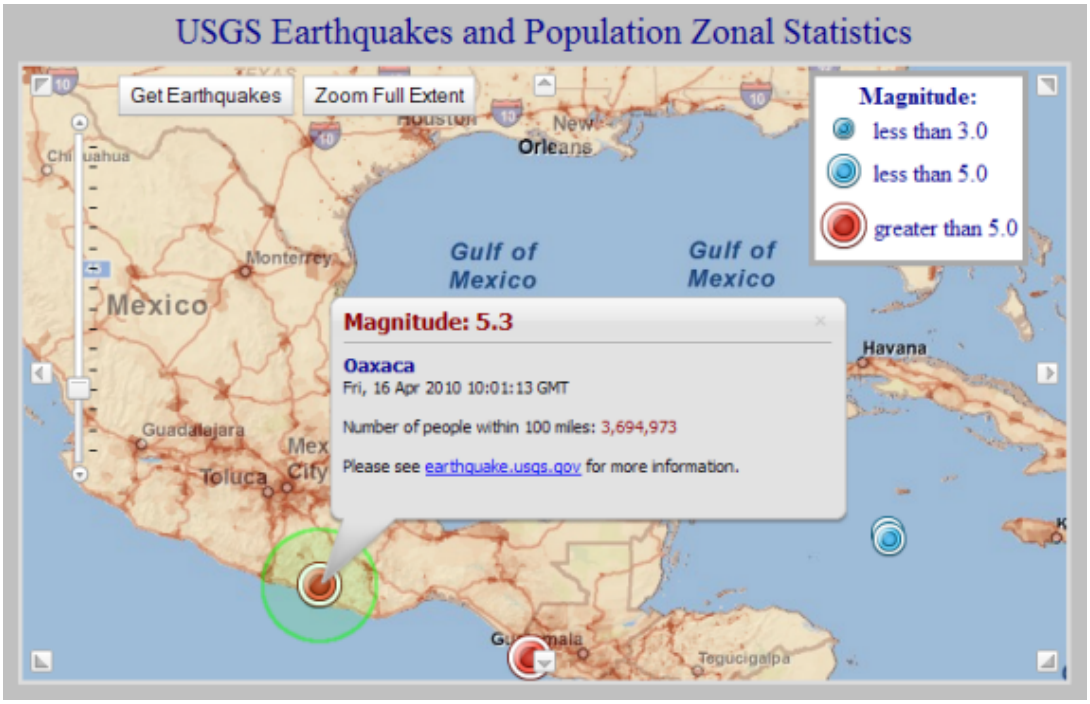
In other cases, it may be important to provide a richer interactive experience for visualizing and comparing features in a particular layer. More detailed reporting and charting can be defined as part of the layer properties.



In many layers, you can click on a feature to see rich information reports and charts. These reports are defined as layer properties in ArcGIS Desktop.

To visualize analytic results

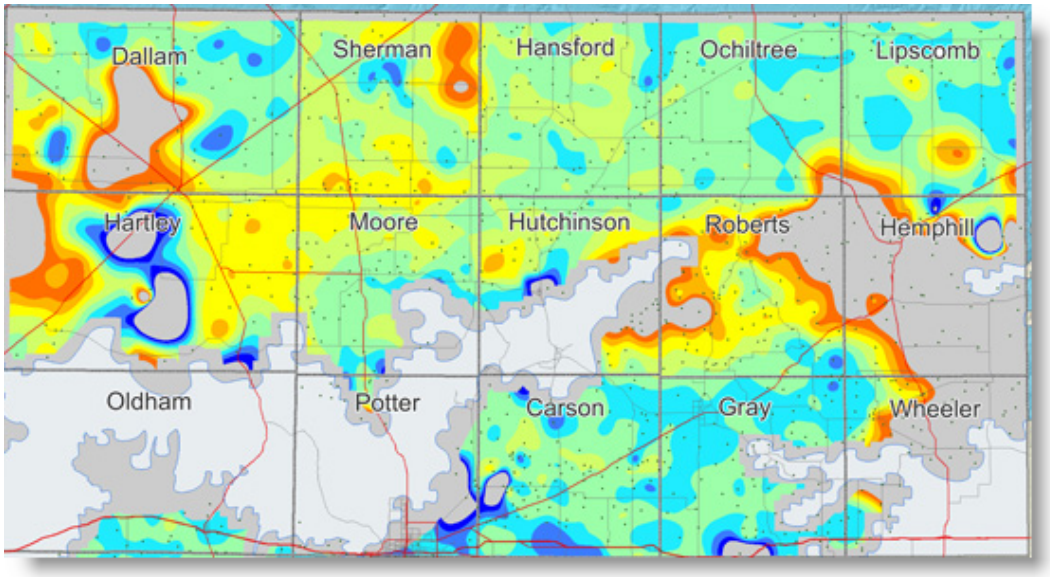
A map layer can be used to access analytic functions and to display and interact with the results.



This map can quickly calculate a population summary of people living within 100 miles of a major earthquake. An analytic model that generates a 100-mile buffer and totals the population within that buffer zone is accessed through this quake map. Analytic models such as this are another kind of layer property that you can define for your GIS maps.

Analysis is how you work with the results as map layers to compare, visualize, summarize, and come to better

understand their meaning.

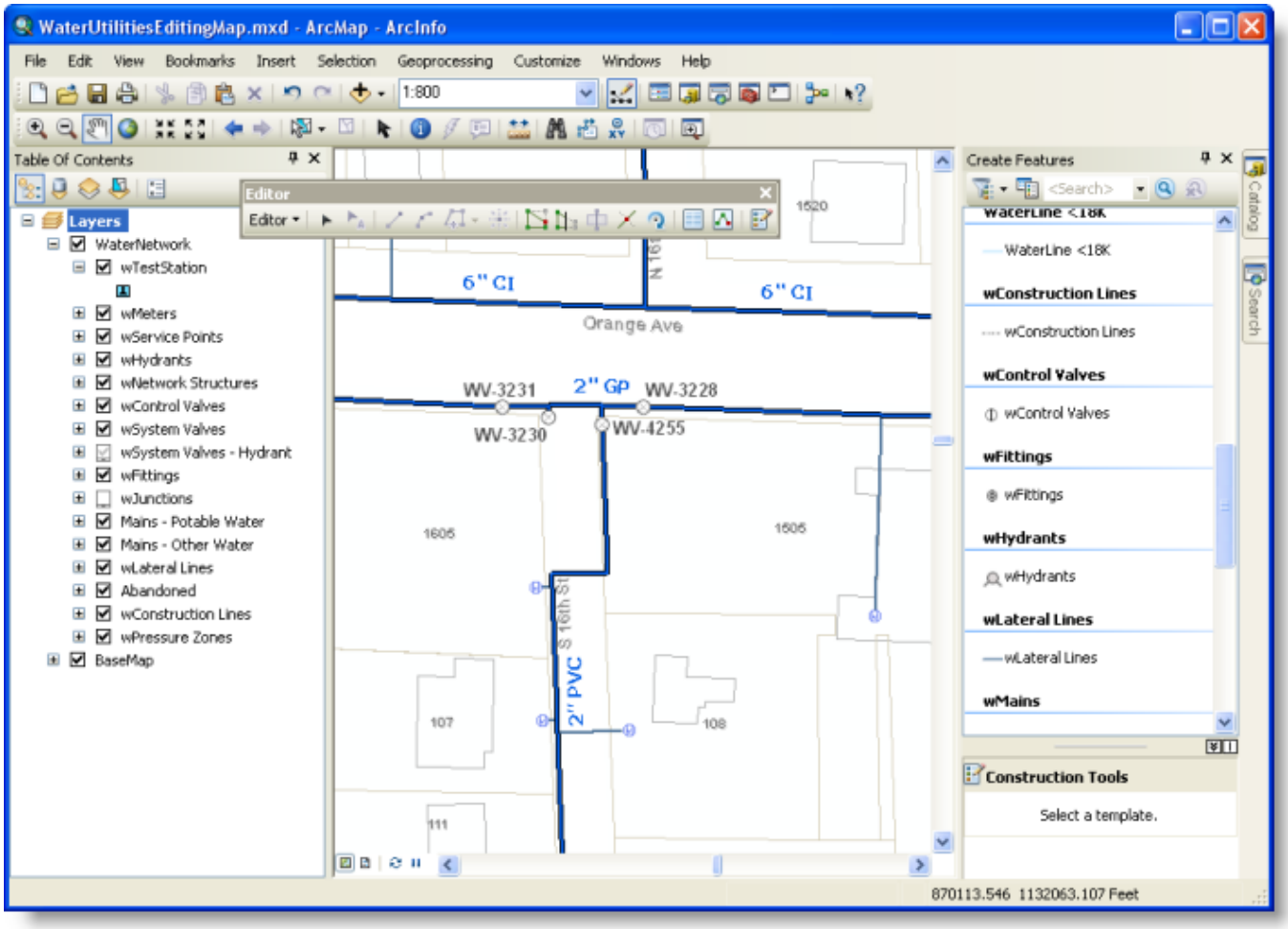


This derived layer represents the change in water depth in the Ogallala Aquifer, which is located beneath the Great Plains in the United States. Hotter colors mean greater change in water depth. The areas overlying the Ogallala Aquifer are some of the most productive agricultural regions in the USA.

To compile and edit features

Map layers can be used to capture new GIS data—editors essentially use the map to add and update features to populate "empty" map layers. The new data is added into geodatabase layers referenced by the map.

Often, enterprise layers are used to share editing and compilation among a number of users. In these cases, the data is stored and managed in a shared multiuser geodatabase.



You can define how a layer is edited as part of the layer properties—what feature types can be added and displayed, what are the default field values, snapping properties, and so on.

ArcGIS map documents encapsulate all of these properties

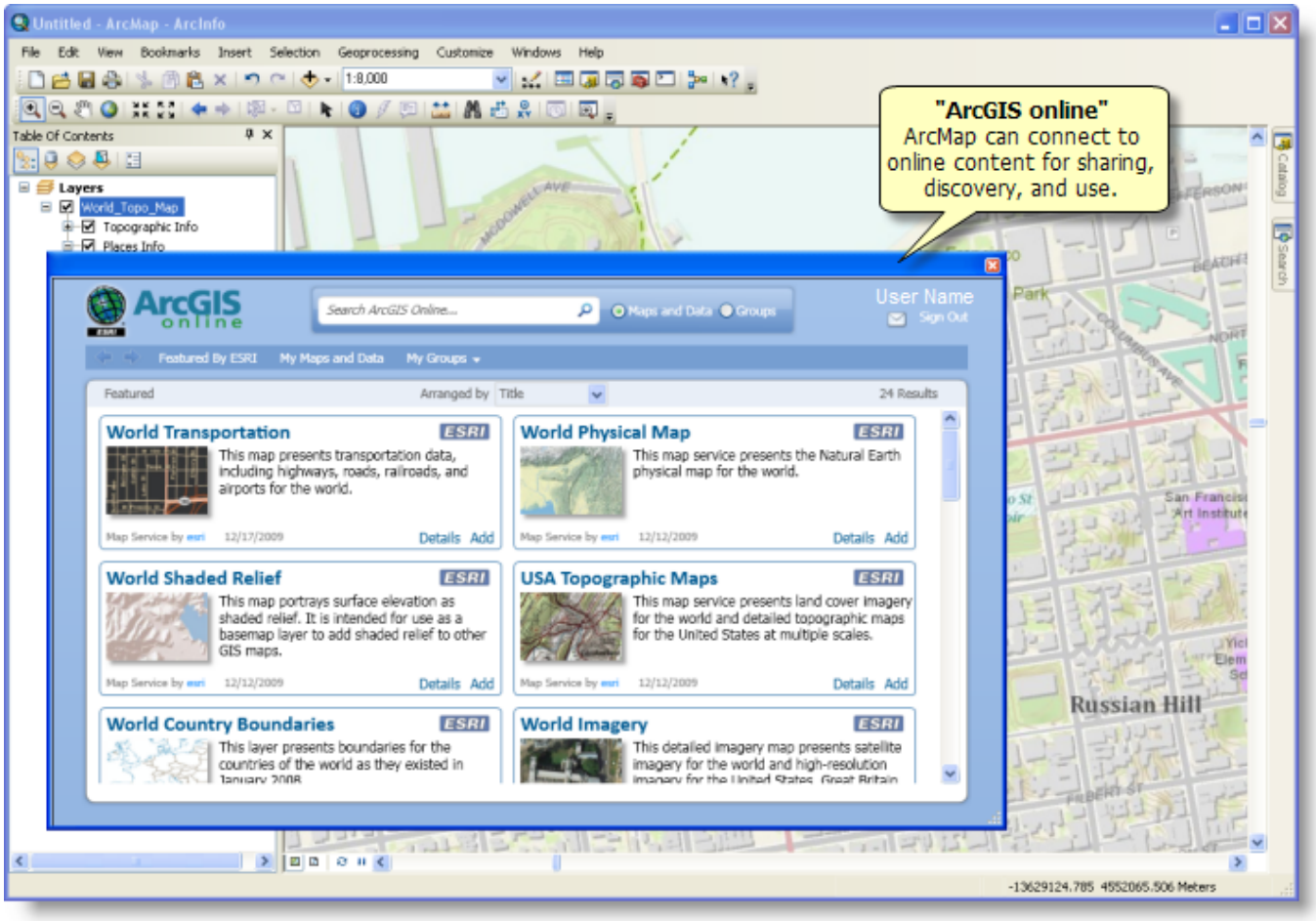
Each GIS map is a specification or design for how geographic information and tools will be used, and GIS maps can be captured, saved, and shared as map documents.

ArcGIS Desktop plays a critical role in GIS deployment and use because it is utilized to create all elements of geographic information: maps, layers, geoprocessing models, geodatabases, and metadata. By creating maps and layers as part of this work, desktop GIS users can encapsulate, and subsequently share, all the aspects for how geographic information is displayed, used, queried, managed, and analyzed.

Online capabilities of ArcGIS Desktop

These ArcGIS documents and packages can also be published as Web services. Using ArcGIS Desktop with ArcGIS Server, you can turn any map, geodatabase, or model into a GIS Web service for sharing in a workgroup, throughout an enterprise, or openly on the Web.

In addition, ArcGIS Desktop includes online capabilities that allow you to share information with others on the Web. You can use these online functions to get connected to other users.



You can find maps and geographic information online (shared by other users), share you own information, and join groups for sharing and collaboration.

Using ArcGIS Desktop to create and share maps and geographic information

Here is the process.

- **Author.** Utilize ArcGIS Desktop to create maps and the geographic information and tools behind these maps. Using ArcGIS, you can create and save map packages and layer packages that encapsulate all of the GIS aspects necessary for map display, map use, analysis, data compilation, and management.
- **Share.** With ArcGIS Desktop, you can share map packages or layer packages with others. By downloading

a layer package that you have chosen to share with me, I can do the same work on my computer that you do on yours. My maps look the same and behave the same; our models and tools are the same; our information schemas are the same; how we edit our features is the same; and so on. This means that you and other GIS users can begin to adopt and share common views and designs for GIS deployments. You can begin to use a common view for accessing and working with rich GIS maps and geographic information.

- **Serve.** Most importantly, you can also publish your maps and layers as GIS Web services using ArcGIS Server. This includes geographic information elements such as geoprocessing models and geodatabases that are referenced by and encapsulated within map packages and layer packages. Serving on the Web opens up access to many potential users.
- **Discover.** GIS Web services are discoverable just like any other Web resource. You can use Google or Bing to find GIS maps and other GIS resources and then put them to use in Desktop.
- **Use.** Any user sitting in front of ArcGIS Desktop, a Web browser, or a mobile phone can discover these GIS maps and other resources and immediately begin to put them to use.

Online sharing using ArcGIS Web maps

ArcGIS.com has a special application for creating and sharing Web maps. These allow anyone to share GIS content using Web maps, which reference this rich geographic information.

Web maps and Web apps can easily be assembled without programming. For example, at ArcGIS.com, a Web map can be built in your Web browser by searching for and finding map services to use as a basemap. You can add a set of map services for your operational layers plus associated tools and widgets that are included when each operational layer is published as a GIS service. This includes tools for information pop-ups; editing tasks; and properties for using dynamic, time-aware layers.

These Web maps are created using the content and services that you author using ArcGIS Desktop. Once you have assembled these elements in a Web map, you can save the Web map and share it. Other users, who use Web browsers and mobile clients, can open and use your shared Web map.

Product levels of ArcGIS Desktop

ArcGIS Desktop is scalable and can address the needs of many types of users. It is available at three functional levels:

1. **ArcView** focuses on comprehensive data use, mapping, and analysis.
2. **ArcEditor** adds advanced geodatabase editing and data creation.
3. **ArcInfo** is a complete, professional GIS desktop containing comprehensive GIS functionality and rich geoprocessing tools. Because of the extensive capabilities of ArcInfo, every GIS site should have at least one copy.

Optional extensions to ArcGIS Desktop

A number of specialized software capabilities are sold as add-on extensions to ArcGIS Desktop. Each extension enables you to add capabilities such as raster geoprocessing, 3D GIS, and network analysis.

Here is a brief overview of the ArcGIS Desktop extensions:

Extension	Overview
ArcGIS 3D Analyst	• ArcGlobe: Interactive 3D scenes • Globe views in ArcCatalog • Globe publishing in ArcGIS Publisher • 3D raster and TIN modeling tools • Publish globe services • LIDAR and terrain datasets
ArcGIS Business Analyst	• Customer and store prospecting • Market penetration analysis • Drive-time analysis • Business and demographic data
ArcGIS Data	

Interoperability	• Directly read, transform, and export any data format • Tools for data transformation and direct use
ArcGIS Geostatistical Analyst	• Advanced kriging and surface modeling • Exploratory spatial data analysis tools • Probability, threshold, and error mapping
ArcGIS Network Analyst	• Network and transportation analysis • Minimum path, closest facility, allocate, and traveling salesman • Advanced network data modeling and simulation
ArcGIS Publisher	• Publish Map and Globe documents for use with the free ArcReader application • Package and compress data • Optional data compression and locking • Developer SDK for customizing ArcReader
ArcScan for ArcGIS	• Perform raster-to-vector conversion tasks on scanned documents • Raster editing, snapping and tracing tools
ArcGIS Schematics	• Database-driven schematic rendering and display • Schematic views of GIS networks and tabular information • Multiple schematic representations
ArcGIS Spatial Analyst	• Advanced raster and vector tools • Spatial modeling • ArcGrid Map Algebra
ArcGIS Tracking Analyst	• Time-based map display and rendering • Playback tools (play, pause, forward, rewind) • Work with time-based data (features whose geometry or attributes move and change)
Maplex for ArcGIS	• Advanced label placement and conflict detection for high-end cartographic production • Simplifies the labor-intensive placement • Included with ArcInfo

Overview of the ArcGIS Desktop extensions

About ArcGIS Desktop extensions

5/26/2011
URL: http://help.arcgis.com/en/arcgisdesktop/10.0/help/00v2/00v200000005000000.htm