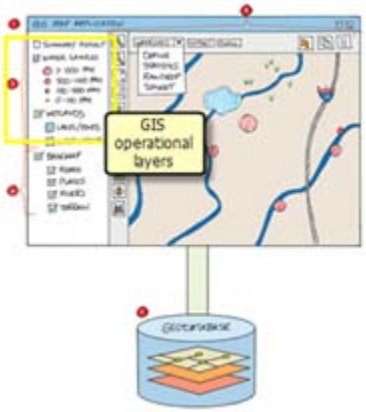
Operational layers

(From A Framework for Deploying Web GIS on help.arcgis.com)



These are the small set of map layers that you work with directly or derive as the result of an operation (such as an analytic model or a query).

Each map application is tailored for use by a particular group of users. The work and mission of each user requires working with a set of operational layers in their GIS map application. For example, an editor in an electrical utility uses ArcMap as his or her application and a land base as the basemap and edits the electrical facilities network as an operational layer as part of their daily work.

There are at least four types of operational map layers:

- **Editing and data access layers.** These are the map layers that your users work with, for example, to edit features, perform queries, and select features for input to analysis. Common examples are the facilities layers edited in a utility or other map layers that can be queried and used by end users.
- **Observations or sensor feeds.** This can be any information that reflects status or situational awareness, for example, crime locations, traffic sensor feeds, real-time weather, readings from meters (such as stream gauges), observations from equipment or made by workers in the field, inspection results, addresses of customers, disease locations, air quality and pollution monitors, and so on. These information sources are often displayed as status information in GIS Web maps. Also, they are frequently used as inputs into analytic operations that are computed on the ArcGIS Server.
- **Query results.** In many cases, applications will make a query request to the server and return a set of records as results. These can include a set of individual features or attribute records. Users often display and work with these results as map graphics in their Web GIS map applications. This approach typically requires application programming to create a map layer of results.
- **Result layers that are derived from analytic models.** GIS analysis can be performed to derive new information that can be added as new map layers and explored, visualized, interpreted, and compared.

In most GIS applications, users work with operational information (sometimes multiple operational layers) on top of their basemap, which provides the geographic context. At other times, the operational layer is displayed underneath other layers that help provide locational context, for example, when you classify and display ZIP or postal code areas by demographic

information, you often overlay these results with transportation lines and place-names to provide locational context.

In either case, the operations that you perform on the layers require a set of software functions to be deployed as tools within the application.

Operational layers are often dynamic; they are retrieved from the GIS database and displayed during runtime, for example, each time you pan, zoom, or refresh your map. It is common that operational layers work within a focused range of map scales and resolutions. By contrast, your basemaps may be designed for use at a wider range of map scales. For example, basemaps typically enable you to zoom out to much larger map extents (and smaller map scales).

It's good to identify the range of map scales at which your operational information is displayed and used. In cases where operational information is used across a broad range of map scales, you'll need to plan for display of your operational map at multiple map scales.

Operational layers should have a series of focused tools that you can use to work with their contents, such as application tools to perform focused editing operations or to query and summarize results and observations. These capabilities are included in the application as a series of tools.

Some operational layers are produced as the result of GIS modeling and analytic operators. In these situations, a task framework is used to provide access to modeling operations hosted on an ArcGIS Server that can compute and serve the model results as operational layers.

In addition, working with results requires a set of tools for interacting with the derived information to visualize, interpret, analyze, compare, and report on conclusions.

It is also worth noting that some of the same datasets that are used in your GIS basemap will also frequently be used as data sources for operational layers in your Web map applications.

For more information about building and serving operational layers, see Building dynamic map layers (operational layers).