SQL and enterprise geodatabases

* [Access dataset properties](https://desktop.arcgis.com/en/arcmap/latest/manage-data/using-sql-with-gdbs/sql-and-enterprise-geodatabases.htm#ESRI_SECTION1_6880CDE75E0F480D9B3F150C7133D9FD)
* [Access geodatabase data](https://desktop.arcgis.com/en/arcmap/latest/manage-data/using-sql-with-gdbs/sql-and-enterprise-geodatabases.htm#GUID-D2376B71-8552-4890-9682-F662A16F3BFB)
* [Edit geodatabase data](https://desktop.arcgis.com/en/arcmap/latest/manage-data/using-sql-with-gdbs/sql-and-enterprise-geodatabases.htm#ESRI_SECTION1_8D81A7D9EC52457FA109C8EA93C226C3)
* [Create tables to be used with ArcGIS](https://desktop.arcgis.com/en/arcmap/latest/manage-data/using-sql-with-gdbs/sql-and-enterprise-geodatabases.htm#ESRI_SECTION1_A2157BB0515A414EAB4799C25A6D6B32)

You can use Structured Query Language (SQL) to access existing datasets and their properties and edit both versioned (traditional) and nonversioned datasets in enterprise geodatabases.

You can also use SQL to create tables that can be registered with the geodatabase. These tables can contain nonspatial attributes and SQL spatial or raster types.

When you access a geodatabase using SQL, you are accessing it at the database management system level. That means behaviors and functionality enforced by ArcGIS are not enforced when you use SQL. Therefore, when you execute SQL commands on data in the geodatabase, you can view data and information about data but should not alter any data that participates in geodatabase behavior. See [What type of data can be edited using SQL?](https://desktop.arcgis.com/en/arcmap/latest/manage-data/using-sql-with-gdbs/what-type-of-data-can-be-edited-using-sql.htm) for more information.

## **Access dataset properties**

You can use SQL **select** statements to obtain the properties of existing datasets in enterprise geodatabases.

Dataset properties are stored in the geodatabase system tables. To get this information, you query specific columns in the system tables. In some cases, these columns contain XML documents that you query using XPath expressions to get the property information. This is true for geodatabases stored in IBM Db2, PostgreSQL, and Microsoft SQL Server databases. For geodatabases in Oracle, you can access system views to read the plain text in a CLOB column.

## **Access geodatabase data**

You can use SQL **select** statements to return data from existing datasets in geodatabases. If you query versioned datasets in enterprise geodatabases, you must use versioned views.

Versioned views incorporate database views and stored procedures, triggers, and functions to allow you to read or edit versioned data in a geodatabase table or feature class using SQL. When a versioned dataset is accessed through a versioned view, all the records in the business table are selected and merged with records from the delta tables to construct a view that includes all the changes made to the business table in the context of the specified version.

To access and analyze simple spatial data with SQL, use the spatial SQL functions that are installed with the spatial type. Each spatial type has its own set of functions. Esri has defined functions for its ST\_Geometry type in Oracle, PostgreSQL, and SQLite, and each database vendor has defined functions for its SQL types. These functions evaluate [spatial relationships](https://desktop.arcgis.com/en/arcmap/latest/manage-data/using-sql-with-gdbs/spatial-relationships.htm), perform [spatial operations](https://desktop.arcgis.com/en/arcmap/latest/manage-data/using-sql-with-gdbs/spatial-operations.htm), and return and set [spatial properties](https://desktop.arcgis.com/en/arcmap/latest/manage-data/using-sql-with-gdbs/geometry-properties.htm).

## **Edit geodatabase data**

You can use the native SQL of your database management system to edit the simple, nonspatial attribute data in the geodatabase. You can also use the spatial SQL functions installed with spatial types to alter simple spatial data using SQL.

You can use SQL to edit both versioned and nonversioned datasets in enterprise geodatabases. However, as mentioned previously, you should not edit datasets that participate in geodatabase functionality.

When you edit nonversioned data, you must insert unique values to Object ID, GUID, and global ID fields using Esri supplied functions and SQL.

You must use versioned views to edit versioned data. The triggers used by versioned views update the delta tables when you edit through a versioned view. This ensures that the insertions are made to the delta tables while editing. Versioned views also insert unique values to Object ID fields automatically.

## **Create tables to be used with ArcGIS**

You can use the native SQL of your database management system to create and populate tables. Both spatial and nonspatial tables you create with SQL can be used with ArcMap and ArcGIS Pro. The attributes in both spatial and nonspatial tables also can be viewed directly in ArcGIS. Both query layers and the ability to directly access tables are useful if you have tables that work with another system at your site and you want to be able to access those tables through ArcGIS or join them to tables in your geodatabase.

If you want your tables to use geodatabase functionality, register the table with the geodatabase. Remember, though, that once the tables use geodatabase functionality, you cannot edit them using SQL.

See [Workflow: Create a table with SQL and register it with the geodatabase](https://desktop.arcgis.com/en/arcmap/latest/manage-data/using-sql-with-gdbs/workflow-creating-a-table-with-sql-and-registering-it-with-the-geodatabase.htm) for instructions.

## **Related topics**

* [What is an ObjectID?](https://desktop.arcgis.com/en/arcmap/latest/manage-data/using-sql-with-gdbs/object-id.htm)
* [What is a versioned view?](https://desktop.arcgis.com/en/arcmap/latest/manage-data/using-sql-with-gdbs/what-is-a-versioned-view.htm)
* [Geodatabase system tables](https://desktop.arcgis.com/en/arcmap/latest/manage-data/using-sql-with-gdbs/overview-geodatabase-system-tables.htm)