Upgrading Geodatabase Raster Data From ArcGIS® 8.3 to ArcGIS 9

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Upgrading Geodatabase Raster Data From ArcGIS 8.3 to ArcGIS 9

Introduction

Many users have stored raster data in ESRI® ArcSDE® 8.3, and when they upgrade their system to ArcGIS® 9 or ArcSDE 9, there are concerns about how the data will behave in the new version and be upgraded. This document describes the behavior of geodatabase raster data when the client and/or server are upgraded from 8.3 to 9.0 and the upgrading paths for various types of geodatabase raster data. Since a few changes have been made to ArcGIS 9 and ArcSDE 9 software products, some steps may need to be taken to utilize the raster data previously stored in the geodatabase. In most cases, the raster data does not need to be reloaded. For some types of raster data, no action needs to be taken at all; for others, a few simple procedures will make the data accessible in the new environment and take full advantage of the improved features. For one rare case, reloading may need to be considered.

The upgrading schedules for ArcGIS and ArcSDE may be different for some users or organizations. It is desirable for users to upgrade both ArcGIS client and ArcSDE server at the same time; however, in some cases, upgrading ArcSDE server with production or live data on it may not be an easy and quick task. Users should experiment with the new version before making any final moves; they may choose to upgrade only ArcGIS client to 9.0, leaving ArcSDE server and data untouched. This will create the setting that consists of ArcGIS 9 client and ArcSDE 8.3 server. Both client/server combination scenarios will be discussed in this document.

The major upgrading paths that are covered in this document are

- Upgrading the raster data set
- Upgrading the embedded raster catalog
- Upgrading the referenced raster catalog
- Loading data with SDERaster

Upgrading the Raster Data Set

The raster data set concept and implementations have changed from 8.3 to 9.0. The difference is the schema change at 9.0. At ArcGIS 9, there is an additional geometry type column in the raster data set business table. This column is added primarily for consistency with the raster catalog schema, but it is rarely used by ArcGIS functions.

Upgrading the raster data set does not necessarily require users to do anything. The raster data set works in both ArcGIS 9/ArcSDE 8.3 and ArcGIS 9/ArcSDE 9 environments. If

the user wants to utilize the geometry column that is available in ArcGIS 9/ArcSDE 9, it is possible to write customized ArcObjects™ code to register the raster data set with the geodatabase. This will add a geometry column to the raster data set business table and populate the raster extent to that column.

Upgrading the Embedded Raster Catalog

Embedded raster catalogs are a set of raster data sets organized through one business table in ArcSDE. At ArcGIS 8.3, embedded raster catalogs are not geodatabase objects; they are plain tables in the geodatabase. Only in the upper application level are they interpreted as raster catalogs based on the raster column and other characteristics stored in ArcSDE system tables. At ArcGIS 9, raster catalogs are fully incorporated into the geodatabase model; the geodatabase is aware of this type of data. The raster catalog schema also changed in ArcGIS 9 to include a geometry type column that stores the footprint of each raster data set in the raster catalog. This addition makes spatial query more efficient for raster catalogs.

Case 1: ArcGIS 9/ ArcSDE 8.3

In this setting, no action needs to be taken; the raster catalogs in ArcSDE 8.3 server behaves in ArcGIS 9 client exactly the same as in ArcGIS 8.3 client. It still displays as a table icon and has the same functionalities; however, the new rendering and spatial search capabilities that are available in ArcGIS 9 cannot be applied to these raster catalogs.

Case 2: ArcGIS 9/ ArcSDE 9

In this case, both client and server are upgraded to 9.0 versions, but the data in the ArcSDE server stays intact in the 8.3 schemas. Without manipulating the raster data, the original raster catalog will behave as a table with a raster column. In ArcGIS 9, a raster layer cannot be created from the table; therefore, no geography display is available (Figure 1).

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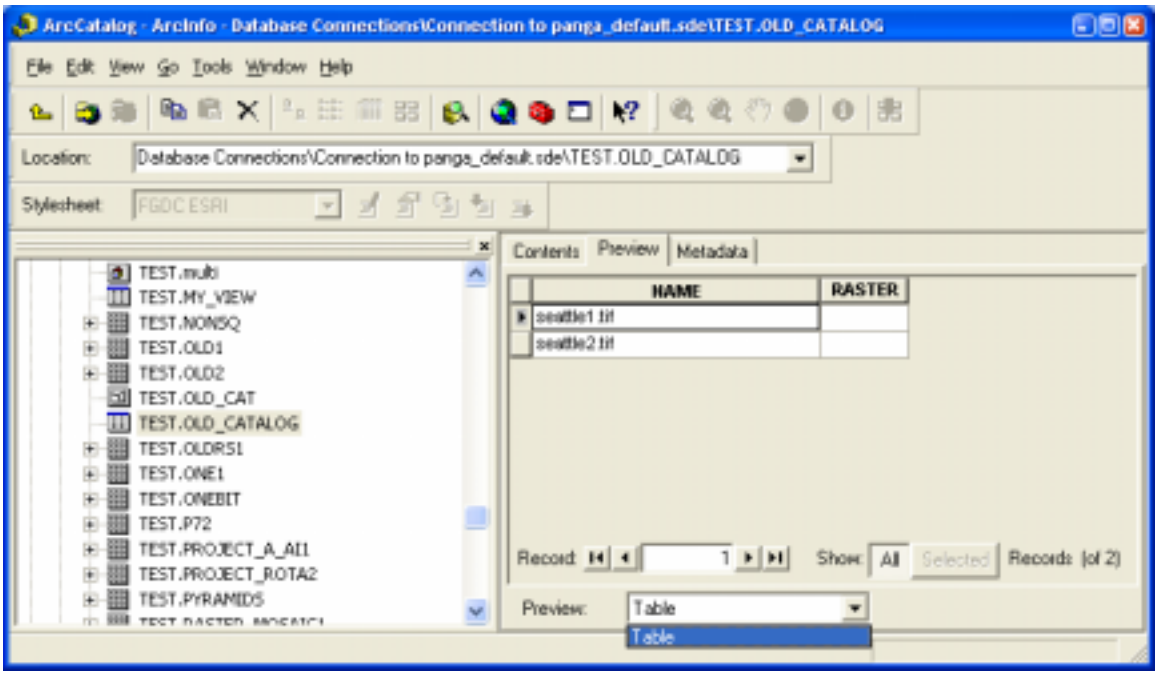
Figure 1
Raster Catalog With 8.3 Schema in ArcGIS 9/ArcSDE 9



To make raster catalogs with 8.3 schema act as a raster catalog in 9.0, you must register the raster catalog with the geodatabase. This command can be executed from the ArcCatalog™ user interface by right-clicking the raster catalog table and selecting Register with Geodatabase from the context menu (Figure 2). This operation adds a geometry type column to the raster catalog business table and updates related geodatabase system tables. A proper *x,y* domain is set for the geometry column in the raster catalog to cover the whole extent of the raster catalog. In addition, the geometry column is populated with the extents of each individual raster data sets in the raster catalog. Once the registration is complete and the raster catalog is in the new 9.0 schema, it can take full advantage of the improved rendering capabilities, spatial search, and the new raster catalog overview panels in ArcCatalog (Figure 3).

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Figure 2
Register with Geodatabase

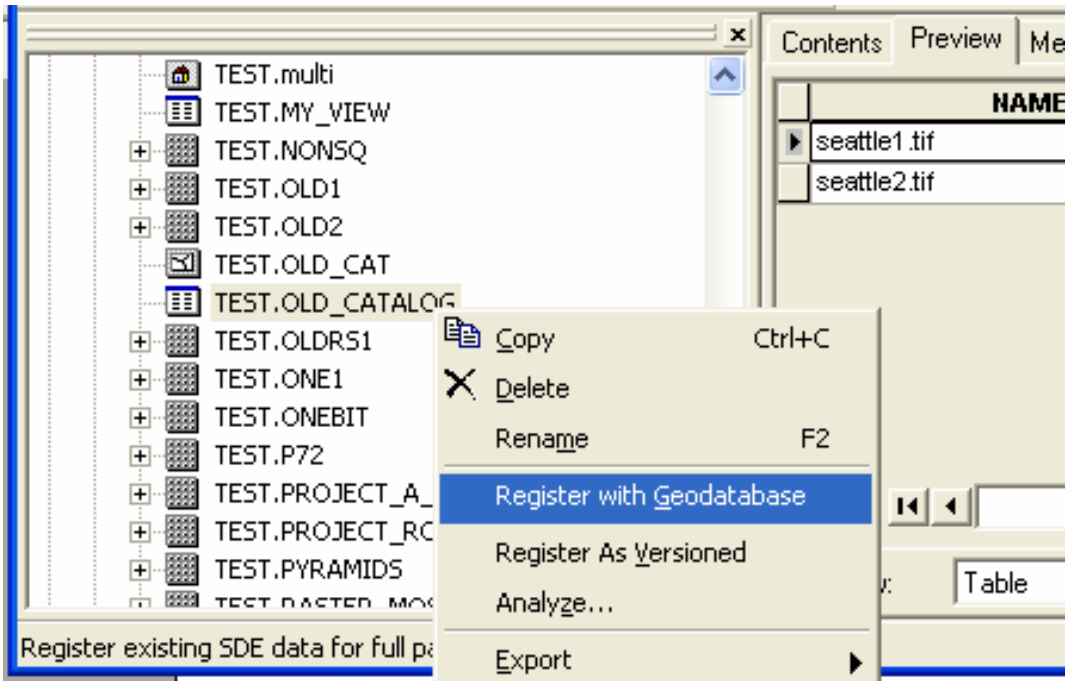
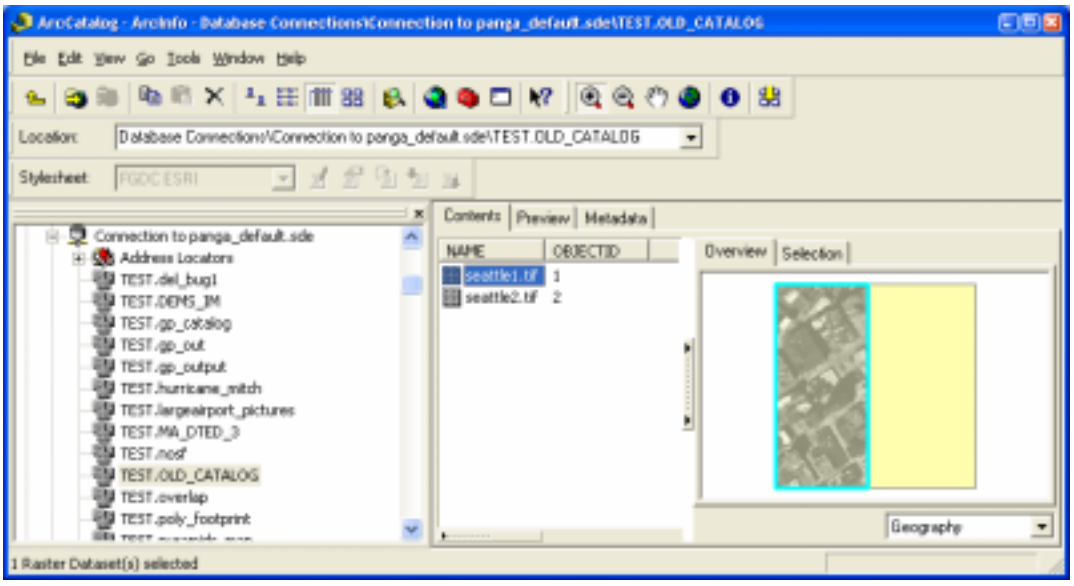


Figure 3
Raster Catalog With 9.0 Schema in ArcGIS 9



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Upgrading the Referenced Raster Catalog

Referenced raster catalogs supported in ArcGIS 8.3 include file raster catalogs (image catalogs in ArcInfo® Workstation) and a Spatial Data Engine™ (SDE®) table that references raster files, raster data sets in ArcSDE, or raster data sets in embedded raster catalogs in ArcSDE. One characteristic of referenced raster catalogs is that their catalog table schema has at least the following five columns: IMAGE, XMIN, YMIN, XMAX, and YMAX.

File-Based Raster Catalog

The file-based raster catalog includes raster catalog tables in the format of .txt file, INFO table, .dbf table, and so forth. These raster catalogs will continue to behave the same way in ArcGIS 9 as in ArcGIS 8.3. Unless the user wants to move the data to ArcSDE, there is no need to take any action. If the user wants to take advantage of the new rendering and spatial query capabilities that are available in ArcGIS 9, there are two possible options. One is to create an unmanaged raster catalog in a personal geodatabase that references all the raster files in the original raster catalog. In this case, no data loading or conversion is needed. The other option is to create a new raster catalog in ArcSDE 9 from the file raster catalog (refer to the sample on Developer Help > Samples > Raster > Converting Raster Data > Convert 8.3 Referenced Raster Catalog to 9.0 GDB Raster Catalog).

SDE Table-Based Reference Raster Catalogs

This type of referenced raster catalog has the raster catalog table stored in ArcSDE, but the rasters referenced can be on file or in ArcSDE.

Case 1: ArcGIS 9/ ArcSDE 8.3

With the ArcSDE server in 8.3 version and client updated to 9.0, the raster catalogs behave the same way as the client in 8.3 when the referenced rasters in the SDE table are all stored in ArcSDE. If any of the referenced rasters are in a file system, an error will occur when trying to draw that particular raster. Ignore the error—the data frame will be displayed instead (Figures 4 and 5).

Figure 4
SDE Table-Based Referenced Raster Catalog

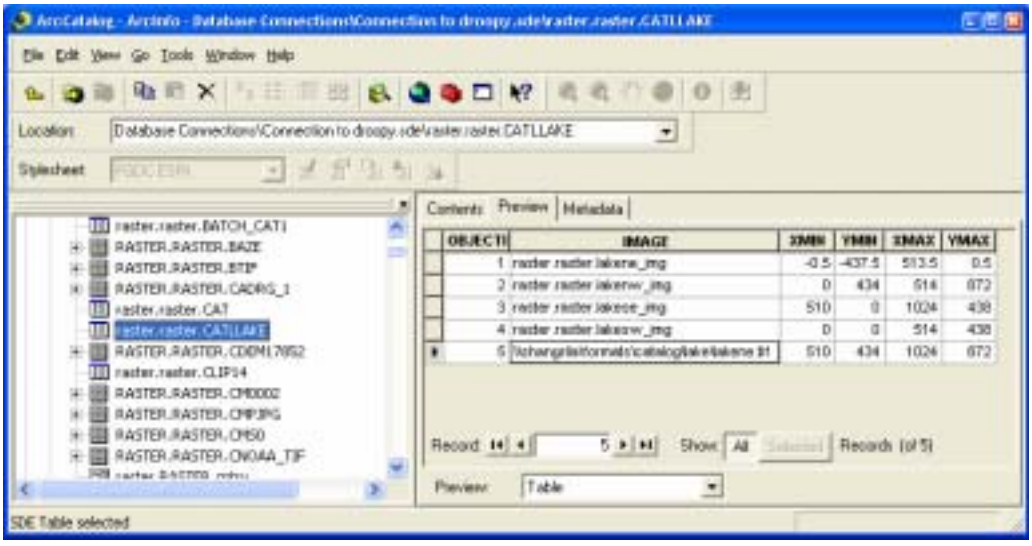

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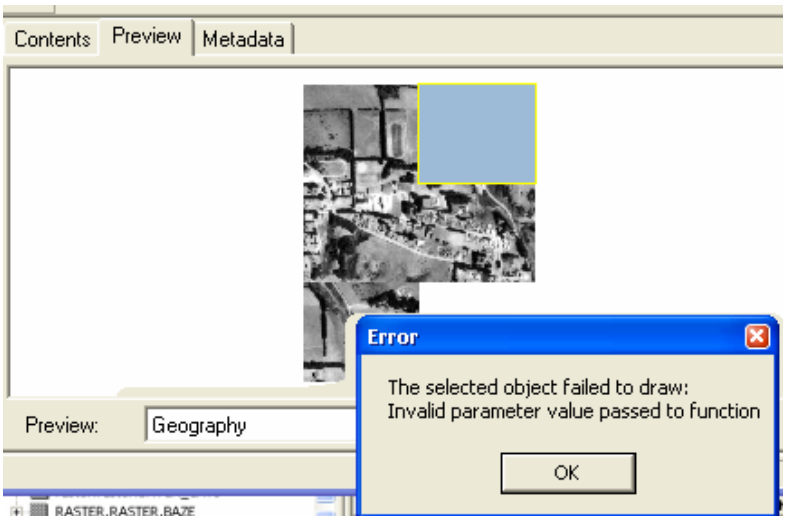
Figure 5
SDE Table-Based Referenced Raster Catalog With File Rasters



Case 2: ArcGIS 9/ ArcSDE 9

Once both ArcSDE and ArcGIS are upgraded to 9.0, the SDE table-based reference raster catalogs are no longer treated as raster catalogs; they are treated as plain tables instead. Only the rows in the table are maintained. The reference or connection to the raster data is lost and no geography view is available. For the data to be accessed as a geodatabase raster catalog in the 9.0 environment, two options are available for the SDE table-based referenced raster catalog if the catalog references files are on disk. One option is to create an unmanaged, personal geodatabase raster catalog that points to the referenced files; the other option is to create an ArcSDE raster catalog and load the data into it. For raster catalogs that reference rasters stored in the database, creating a new raster catalog and reloading the data have to be considered. Refer to the sample in the Developer Help (Develop Help > Samples > Raster > Convert 8.3 Referenced Raster Catalog to 9.0 GDB Raster Catalog) for upgrading the referenced raster catalog to a 9.0 geodatabase raster catalog.

Loading Data With SDERaster

In the ArcGIS 9/ArcSDE 9 environment, it is recommended that you use ArcGIS Geoprocessing tools to load raster data to the geodatabase. However, for certain cases, the user may want to use the SDERaster command to load the data (for example, when ArcSDE and data are all installed on a UNIX system and the user has compiled batch loading scripts with SDERaster that are well tuned for specific needs). As long as SDERaster is being used to load data, the issues that might occur must be dealt with.

At 9.0, both raster data set and raster catalog schemas contain a geometry type column, but SDERaster command is not aware of this column since the schemas are defined at the geodatabase level, which is on top of the SDE C application program interface. Basically, the SDERaster command loads data only to the raster column. For raster data sets, the geometry column is not required for data access or display in ArcGIS; therefore, loading raster data sets with SDERaster command will create a raster data set that can be

directly used in ArcGIS 9. If the geometry column is somehow needed for certain applications, the data set has to be registered with the geodatabase by using ArcObjects.

Create a Raster Catalog and Insert With SDERaster

Creating a raster catalog with the SDERaster command will result in a raster catalog in 8.3 schema that does not have a geometry column in its business table. It is interpreted as a table with a raster column in ArcGIS 9. To make it a 9.0 geodatabase raster catalog, the user must register it with the geodatdabase after loading all the data (Figure 2).

Create a Raster Catalog With the Geoprocessing Tool and Insert Rasters With SDERaster

If the user creates a raster catalog with the Geoproecessing tool or ArcObjects, the raster catalog is in 9.0 schema, which includes both the raster column and geometry column. Once the raster catalog is created, SDERaster command is used to insert raster data. The raster column is then populated with the rasters, and the geometry column remains empty since SDERaster does not utilize that column. With an empty geometry column, a raster catalog cannot be previewed in ArcGIS. Since there is not a Geoprocessing tool or context menu to update the geometry column for a raster catalog yet, it has to be done using ArcObjects. The following sample Visual Basic code updates the geometry column in the raster catalog with the extent of the rasters in the catalog. The code is also published on Developer Help > Raster > Converting Raster Data > Update Geometry Column In Raster Catalog.

Sample Visual Basic Code for Updating the Geometry Column

```
Sub UpdateGeometryInRasterCatalog(pSDEWs As IRasterWorkspaceEx, sCatalog As
string)

  ' Update the geometry column in a 9.0 raster catalog
  Dim pCatalog As IRasterCatalog
  Dim pCatalogHelper As IRasterCatalogHelper

  'Open raster catalog
  Set pCatalog = pSDEWs.OpenRasterCatalog(sCatalog)

  'Initialize helper class
  Set pCatalogHelper = New RasterCatalogHelper

  'Update the geometry
  pCatalogHelper.UpdateFootprint pCatalog

  Set pCatalog = Nothing
  Set pCatalogHelper = Nothing

End Sub
```