How to Import More Than 256 Columns of Data into a GIS

September 2011

This tutorial shows users how to add comma delimited .csv files into Esri ArcGIS that contain more than 256 columns of data. Under normal operations, ArcGIS is unable to import more than 256 columns of a single .csv file due to a Microsoft software limitation. Additional fields are stripped away and the 256 column .csv file is opened without notification that fields were removed.

While most users who typically work with smaller tables and datasets will never encounter this issue, it is common to perform an NHGIS data extract of one or more tables that results in a .csv file exceeding 256 columns. For example, one particular table from the 2000 Census has more than 1400 columns of data. If a user attempts to bring the .csv file with this one table into ArcGIS, the vast majority of the data are stripped away.

Users do have options, however, to make sure all of their data can be utilized by ArcGIS. Two common workarounds are detailed in this tutorial document. First, the Quick Import tool available through the Data Interoperability extension is used. Second, the large .csv file is broken apart into smaller, less than 256 column .csv files using Microsoft Excel and are then rejoined and exported in an alternative format within ArcGIS.

These instructions are based on Esri's ArcGIS 10 software package. While the steps are the same, those using a version of ArcGIS 9 may notice their screen looks different than the images shown here. In addition, other GIS packages (MapInfo, Intergraph's GeoMedia, GRASS, etc.) may yield different results when adding large .csv files to map documents.

This tutorial assumes that you have already downloaded tabular data with more than 256 columns and in the .csv format from NHGIS onto your computer and have unzipped all files.



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The premise behind Data Interoperability is that it allows data to be more easily transferred between ESRI and non-ESRI native formats. The comma delimited .csv file downloaded from NHGIS will be converted to a file geodatabase table that is not confined to the 256 column limit.

That Data Interoperability extension does not come standard with ArcGIS, but many NHGIS users have access to it through their company, university, or student trial license. If available, turn on the extension by selecting Customize>Extensions and then clicking the check box next to Data Interoperability on.

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		Description:
		ArcGIS Data Interoperability 10.0 Copyright (c) 1993-2010 Safe Software Inc. All Rights Reserved
		The ArcGIS Data Interoperability extension enables ArcGIS to read and process the GIS and CAD formats supported by
		Safe Software's FME.
		Build 6213 (20100329)

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Once the Data Interoperability extension is turned on, you will be able to utilize the Quick Import tool within ArcToolbox. It is found within the Data Interoperability Tools.

About Extensions

Close

In your blank map document, click to open the Quick Import tool.

With the Quick Import window open, click the Input Dataset browse button. This opens the Specify Data Source dialogue box, where you will select the .csv file you wish to import.

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Input Dataset	Quick Import	
Output Staging Geodatabase	Converts data in any format supported by the ArcGIS Data Interoperability extension into feature classes.	
	The output is stored in an interim staging geodatabase. The geodatabase can then be used or further post- processing can be performed.	
OK Cancel Environments << Hide Help	Specify Data Source Reader Format: Dataset: Parameters Coordinate System: Unknow	
	Help	OK Cancel

Using the Dataset browse button, navigate to the .csv file you wish to import. In this case, it is a file called "More_Than_256.csv." Once you select the appropriate file, click the Parameters button.

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File name: More_Than_256	Reader Format: Comma Separated Value (CSV) Dataset: C:\MoreThan256Columns\More_Than_256.csv Parameters Coordinate System: Help OK

Inside the Parameters dialogue box, a number of options are available to the user. Most important for our purposes is the "File Has Field Names" box. Check this box on, and click OK, and OK again on the Specify Data Source dialogue box.

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Finally, select a location and name for the Output Staging Geodatabase. In this example, I have simply called the geodatabase "MoreThan256." and placed it in the same folder as the existing .csv file. The file extension will automatically be added.

This geodatabase is not meant to be the table's permanent home necessarily, but rather, as a temporary location where you can decide what to do with it.

In fact, if you select an existing geodatabase as the Output Staging Geodatabase, the tool may either fail to run successfully or the existing geodatabase content will be removed and replaced with this imported table.

Input Dataset More_Than_256 [CSV]	 Quick Import
Output Staging Geodatabase C: WoreThan256ColumnsWoreThan256	Converts data in any format supported by the ArcGIS Data Interoperability extension into feature classes. The output is stored in an interim staging geodatabase. The geodatabase. The geodatabase can then be used or further post- processing can be berformed.

Once the Quick Import tool successfully runs, you can add your table to ArcGIS with all columns intact! This example shows the last column as being "FUM379", whereas the .csv file directly added to ArcGIS maxed out at the 256th column call "FUM218", indicating that 161 additional columns of data are now included in the table that previously were not.

Add Data Look in: MoreThan256Columns MoreThan256.gdb More_Than_256.csv Name: Show of type: Datasets and Lavers 	Add Data
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The Original .CSV File

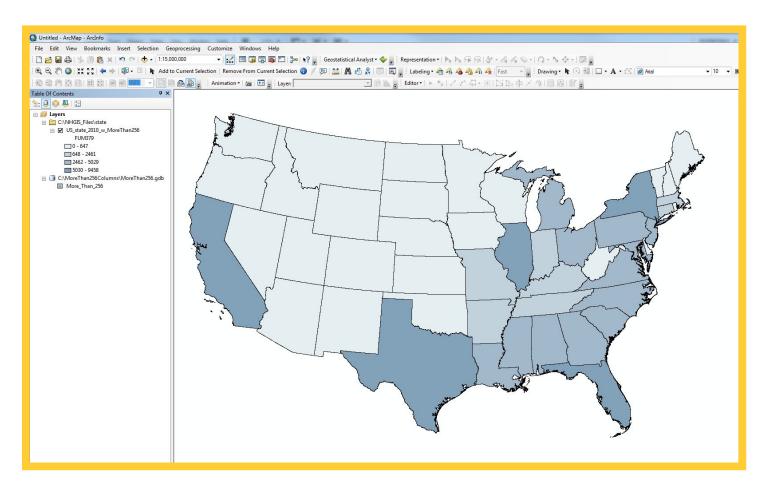
Notice how the number of columns has changed between the .csv file and the geodatabase table in ArcGIS.

The Geodatabase Table After Quick Import

	FUM379	FUM/78	FUM377	FUM376	FUM375	FUM374
	3510	B527	3778	3652	3883	4010
	17	19	34	3032	33	4010
	325	304	369	378	369	420
	1119	1065	1252	1062	1245	1233
	5831	5663	6498	6622	7398	7326
	347	372	409	397	419	450
	756	795	897	875	967	1037
=	411	405	388	409	489	473
	1441	1435	1623	1517	1640	1525
	5821	5954	6612	6517	6993	7232
	5029	5154	5827	5753	6292	6364
	18	10	17	14	26	10
	4	4	1	5	4	4
	5513	5319	6067	6064	6619	6793
	1358	1472	1619	1560	1684	1640
	118	119	112	134	164	121
	406	385	430	423	453	442
	824	846	859	854	909	916
	3784	3861	4289	4129	4508	4595
	4	11	8	9	5	10
	3751	3879	4291	4259	4704	4783
	781	793	925	888	968	1049
	4020	3971	4326	4212	4506	4482
	197	219	213	219	244	244
	2717	2605	3018	2790	3043	3264
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Given that the geodatabase created by Quick Import is intended as a staging geodatabase, you may benefit from either copying the table to your project's geodatabase (if you have one) or join the table to a corresponding shapefile downloaded from NHGIS using the "GISJOIN" field.

Additional information on creating joins can be found in the *How to Join NHGIS Data and Boundary Files* User's Guide found on the NHGIS website.



The new geodatabase table permanently joined and exported to a US States shapefile.

Another option for getting more than 256 columns of data from a .csv file into ArcGIS is to manually break the .csv apart using Excel or other software, and then join the small .csv files, one at a time, to a shapefile or feature class inside ArcMap or ArcCatalog. Note that this method is far from ideal, and if users have the Data Interoperability extension available, the Quick Import method is preferred.

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13	G150	2000			40	4	9
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22	G240	2000			40	3	5
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28	G300	2000			40	4	8
29	G310	2000			40	2	4
30	G320	2000			40	4	8
31	G330	2000			40	1	1
32	G340	2000			40	1	2
33	G350	2000			40	4	8
34	G360	2000			40	1	2
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	162	186			201	221	188	199		207			208	171	188	187		221			
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	484	417			407	408	430	391		382			352	370	345		387	372			
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Notice that the first column in this 479 column .csv file is the "GISJOIN" field. This field is the key used to link the NHGIS shapefiles to the .csv data. As you cut and paste columns of the large .csv into each smaller file, you must include the "GISJOIN" field with each smaller .csv file.

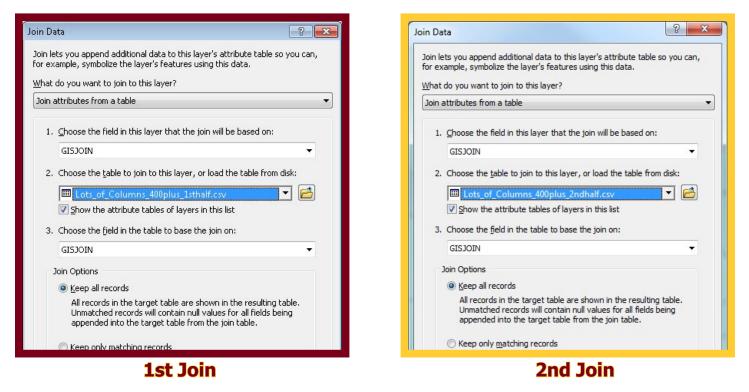
In this example, the 479 column .csv file has been broken into 2 smaller .csv each approximately having 240 columns of data. You may choose to break up your .csv by as few or as many columns (less than 256, of course!) as you wish. This .csv could have been split into five files each having less than 100 columns, if one desired.

While the end goal is to recombine these small .csv files in a different file format in ArcGIS, you should be cognizant of how the file is broken up. For example, if your .csv contains data from two different tables, you may wish to split the file at the break in tables. This way, if you chose not recombine the .csv files in ArcGIS, your smaller files would each contain an entire table, rather than having a table split between two separate files.

Method 2: Break Large .CSV Into Several Small .CSV

In this example, our 479 column .csv file has been broken into two separate .csv files. One is called "Lots_of_Columns_400plus_1sthalf.csv" and the other is "..._2ndhalf.csv." Each file contains the GISJOIN field that was found in the first column of the original .csv file. In ArcMap, these two files are added, alongside an NHGIS shapefile for the states in the year 2000.

Using a join operation, both .csv files are attached to the shapefile one at a time.



Alternatively, one .csv can be joined to the other (again using GISJOIN as the joining field) if you do not want the data connected to a shapefile or if no shapefile exists for the data.

Additional information on creating joins can be found in the *How to Join NHGIS Data and Boundary Files* User's Guide found on the NHGIS website.

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Two separate joins on the one shapefile

Method 2: Break Large .CSV Into Several Small .CSV

The smaller .csv files joined to the shapefile, the final step is to export the data. In this example, the shapefile with the US states is now joined with the two separate .csv files that together contain over 400 columns of data and is exported with the name "Shapefile_w_400plus.shp."

While this step is not required to utilize the data in analysis and mapping, it is highly recommended. The complexity of multiple joins with files containing hundreds of columns may cause notable computer slowdowns with ArcGIS if the data is not exported to a new shapefile or geodatabase feature class.

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