How to Import More Than 255 Columns of Data into a GIS

September 2011

with August 2012 update

This tutorial shows users how to add comma delimited .csv files into Esri ArcGIS that contain more than 255 columns of data. Under normal operations, ArcGIS 9.x and 10.0 are unable to import more than 255 columns of a single .csv file due to a Microsoft software limitation. Additional fields are stripped away and the 255 column .csv file is opened without notification that fields were removed. **This issue has been rectified in ArcGIS 10.1, allowing users to import .csv files of 256** *columns and greater.*

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 that results in a .csv file exceeding 255 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. The addition of American Community Survey (ACS) data to NHGIS, with separate estimate and margin of error columns for each attribute also are creating larger and larger files.

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 255 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 10.0 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 255 columns and in the .csv format from NHGIS onto your computer and have unzipped all files.



Funding provided by the National Science Foundation and National Institutes of Health. Project support provided by the Minnesota Population Center.

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 255 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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Table Of Contents 4 ×	Data Interoperability
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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.

Quick Import	
Input Dataset	Quick Import
 Output Staging Geodatabase Image: 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.
	Specify Data Source
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OK Cancel Environments < <hide help<="" th=""><th>Dataset:</th></hide>	Dataset:
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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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More_Than_256			
		Specify Data Source	
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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.

 Vuick Import
Quick Import Input Dataset More_Than_256 [CSV] Output Staging Geodatabase C:\WoreThan256Columns\WoreThan256 C:\WoreThan256Columns\WoreThan256 Imput Dataset Imput Dataset Quick Import Output Staging Geodatabase C:\WoreThan256Columns\WoreThan256 Imput Dataset Imput Dataset Output Staging Geodatabase C:\WoreThan256Columns\WoreThan256 Imput Dataset Imput Dataset C:\WoreThan256Columns\WoreThan256 Imput Dataset Im
OK Cancel Environments << Hide Help Tool Help

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 (1 automatically added ID column and 255 .csv columns) called "FUM218", indicating that 161 additional columns of data are now included in the table that previously were not.

Add Data	
Look in: MoreThan256Columns A MoreThan256.gdb More_Than_256.csv Name: Show of type: Detection of type:	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

	X						
		FUM379	FUM.78	FUM377	FUM376	FUM375	FUM374
		3510	3527	3778	3652	3883	4010
Λ.		17	19	34	32	33	37
		325	304	369	378	369	420
		1119	1065	1252	1062	1245	1233
1		5831	5663	6498	6622	7398	7326
1		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
		1820	1783	1982	1972	2186	2088
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/		127	156	170	149	193	205
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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 255 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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7	G080	2000		40	4	8
8	G090	2000		40	1	1
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17	G180	2000		40	2	3
12	G200	2000		40	2	4
19	G210	2000		40	3	6
20	G220	2000		40	3	7
21	G230	2000		40	1	1
22	G240	2000		40	3	5
23	G250	2000		40	1	1
24	G260	2000		40	2	3
25	G270	2000		40	2	4
26	G280	2000		40	3	6
27	G290	2000		40	2	4
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
35	G370	2000		40	3	5
36	G380	2000		40	2	4
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2	179	216	194	201	213	248	214	242	232	214	216		192	152	157	164	151	143	182	176	
3	1162	1152	1121	1170	1090	1105	1082	886	829	769	756		646	659	671	635	647	635	621	637	
4	3037	3098	2936	2851	2927	2822	2702	2446	2462	2255	2001		2073	2078	1887	1893	1802	1895	1821	1905	
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10	17	13	7	13	3	3	10	10	12	16	20		9	19	13	17	10	15	15	22	
11	425	412	410	417	412	410	481	443	522	454	472		445	430	445	387	403	454	428	454	
12	194	164	153	158	175	166	189	195	257	265	215		244	210	221	234	232	239	212	256	
13	17	26	17	17	21	16	25	26	50	58	54		58	48	47	34	32	41	40	28	
14	175	174	176	184	169	164	163	184	157	151	147		140	135	162	143	132	139	138	146	
15	270	257	229	268	260	264	259	290	323	319	304		306	308	288	298	275	276	302	281	
16	109	160	121	113	129	118	126	140	159	140	151		160	134	101	145	140	158	152	153	
17	100	90	95	83	74	86	63	107	100	99	91		72	76	64	79	74	84	64	77	
18	244	246	236	231	221	219	252	267	257	267	242		211	267	236	196	173	215	237	231	
19	65	55	68	48	80	69	79	84	87	75	82		80	62	82	74	68	64	88	79	
20	257	237	257	262	273	253	279	271	245	231	208		190	201	192	165	183	180	162	205	
21	12	67	/3	70	76	/6	74	60	58	56	60		52	52	34	45	50	49	53	48	
22	120	112	110	122	130	128	128	121	122	121	110		119	125	119	108	107	117	120	112	
23	529	516	529	597	549	542	592	557	516	152	452		492	467	446	451	429	50 167	120	501	
25	579	648	600	635	644	584	626	567	468	500	491		440	413	447	404	392	418	395	421	
26	130	97	117	138	130	105	123	122	90	127	119		84	86	72	93	102	87	95	89	
27	165	191	224	243	226	218	215	221	215	224	197		206	181	172	179	182	193	178	215	
28	665	698	678	668	606	680	660	622	525	485	424		433	430	387	375	357	372	355	373	
29	181	161	169	179	178	173	150	138	153	133	128		126	114	125	111	115	123	113	101	
30	247	233	268	233	232	228	229	191	222	249	164		188	202	189	193	194	186	230	235	
31	27	20	25	29	30	23	19	33	32	25	23		24	19	21	12	24	28	15	31	
32	171	154	142	147	141	156	130	160	184	163	172		175	165	191	173	193	189	188	179	
33	1939	1968	1928	1919	1866	1834	1821	1639	1583	1391	1391		1371	1359	1253	1205	1260	1218	1224	1276	
34	817	783	753	729	693	676	719	705	737	733	662		678	655	638	659	628	631	659	671	
35	818	824	867	820	823	764	852	795	880	880	943		858	857	877	802	778	892	847	874	
30	343	402	379	400	346	351	3/1	322	300	326	261		20/	244	238	205	232	225	237	201	
38	2935	2772	2701	2822	201	221	3070	2752	225	207	225		200	2071	1982	16/	1875	1844	1870	1929	
39	484	417	458	462	407	408	430	391	429	382	343		352	370	345	1507	387	372	396	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.

Join Data 🔹 😨 💌	Join Data
Join lets you append additional data to this layer's attribute table so you can, for example, symbolize the layer's features using this data.	Join lets you append additional data to this layer's attribute table so you can, for example, symbolize the layer's features using this data.
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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.

Export Data	? 💌
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Use the same coordinate system as:	
Ithis layer's source data	
🔘 the data frame	
 the feature dataset you export the data into (only applies if you export to a feature dataset in a geodatabase) 	
Output feature class:	
C:\MoreThan256Columns\Shapefile_w_400plus.shp	
ОК	Cancel

