



Geocoding Tutorial using GeoPinpoint Suite

Geocoding involves assigning latitude and longitude coordinates to an item described in terms of its postal address. There are different ways to geocode. This tutorial will describe how to geocode a set of Canadian addresses using DMTI's GeoPinpoint Suite and display them as points in ArcGIS.

Your data should be formatted so that you have headings for city and province. Also, postal codes should not have spaces (e.g., M3K1S7). The address can be unparsed or parsed. Unparsed means that the street number and street name are together in one field, parsed means that you have separate fields for street number and street name (e.g., "41 Ancaster Rd" vs. "41" and "Ancaster Rd"). For the tutorial example, we will use unparsed addresses.

Note: The tutorial assumes that you are starting with a Microsoft Excel spreadsheet, where each row is an address. It will walk you through the steps to convert this into a Microsoft Access database because GeoPinpoint software only works with Access databases. If your data is already in Microsoft Access database format or you already know how to convert an Excel spreadsheet into an Access database, then skip to step 9. This tutorial uses Microsoft Excel 2002 and Microsoft Access 2002.

1. Ensure that your spreadsheet of data conforms to the guidelines above. Our example is a list of community centres in Toronto. You can download it from <http://maps.library.utoronto.ca/datapub/helpsheets/communitycentres.xls>. It has names of community centres and their addresses, one per row.

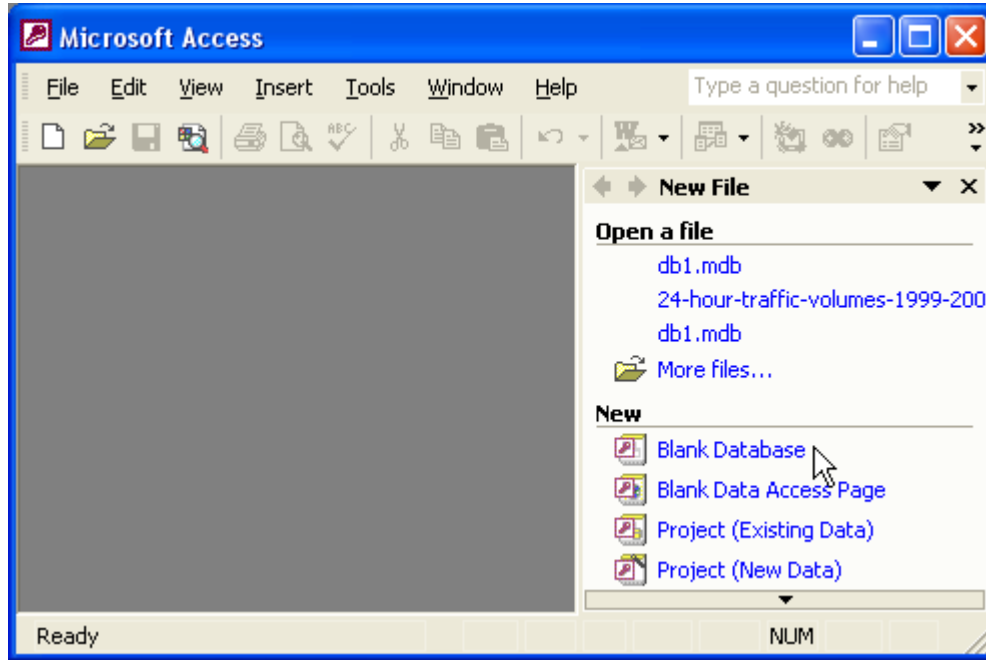
The screenshot shows a Microsoft Excel spreadsheet titled "communitycentres.xls". The spreadsheet has five columns: A (CommunityCentres), B (Address), C (City), D (Province), and E (PostalCode). The data is as follows:

	A	B	C	D	E
1	CommunityCentres	Address	City	Province	PostalCode
2	Ancaster Park	41 Ancaster Rd	Toronto	ON	M3K1S7
3	Broadlands Park	19 Castlegrove Blvd	Toronto	ON	M3A1K9
4	Maurice Cody	181 Cleveland St	Toronto	ON	M4S3C1
5	St. Lawrence	230 The Esplanade	Toronto	ON	M5A4J6
6	L'Amoreaux	2000 McNicoll Ave	Toronto	ON	M1V5E9
7	Tam Heather	730 Military Trail	Toronto	ON	M1E4P7
8	Scadding Court	707 Dundas St W	Toronto	ON	M5T2W6
9	Fairmount Park	90 Bowmore Rd	Toronto	ON	M4L3J2
10	John Innes	150 Sherbourne St	Toronto	ON	M5A2R6
11					

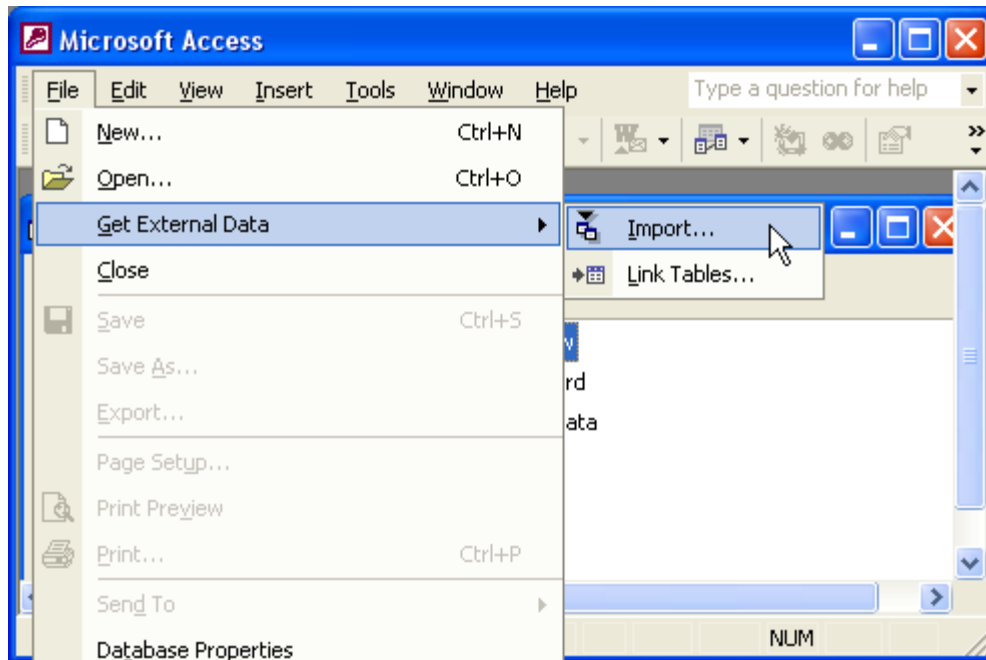


UNIVERSITY OF TORONTO MAP & DATA LIBRARY

2. Open up Microsoft Access and create a new blank database by clicking on **Blank Database** in the right toolbar (you will be prompted to give it a new name and asked where to save the new database file (".mdb" file):



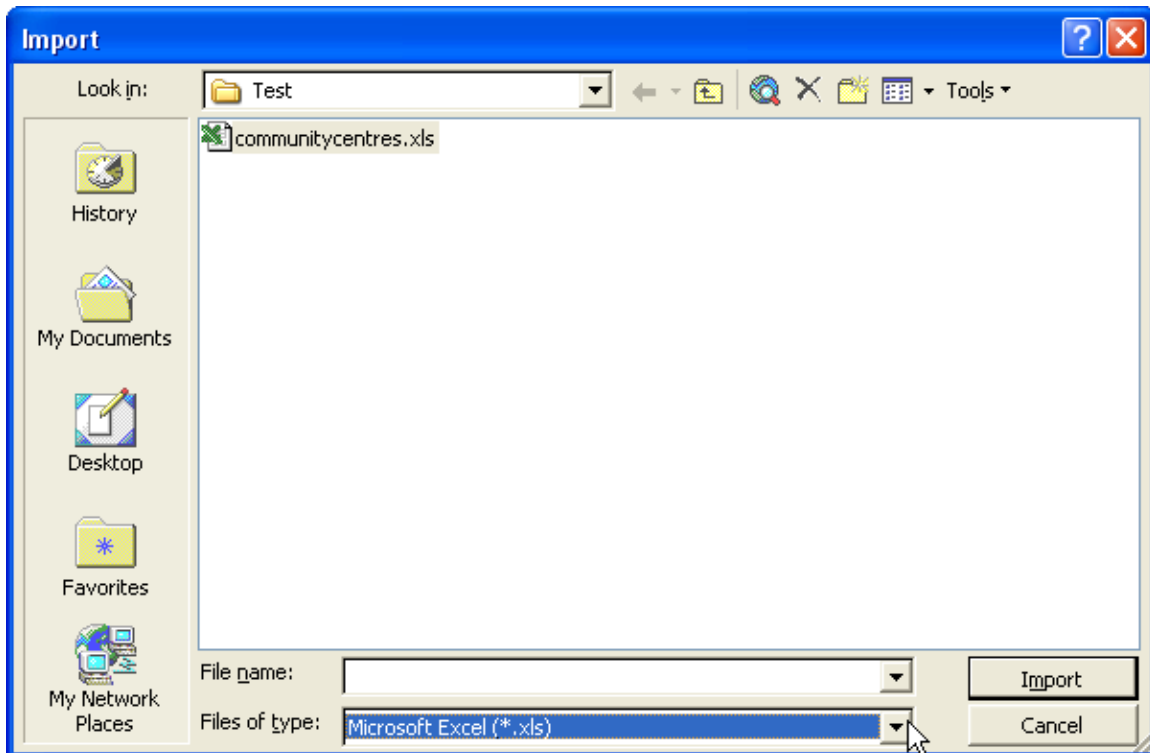
3. Import the Microsoft Excel spreadsheet into the newly created database by selecting **File->Get External Data->Import...**





UNIVERSITY OF TORONTO MAP & DATA LIBRARY

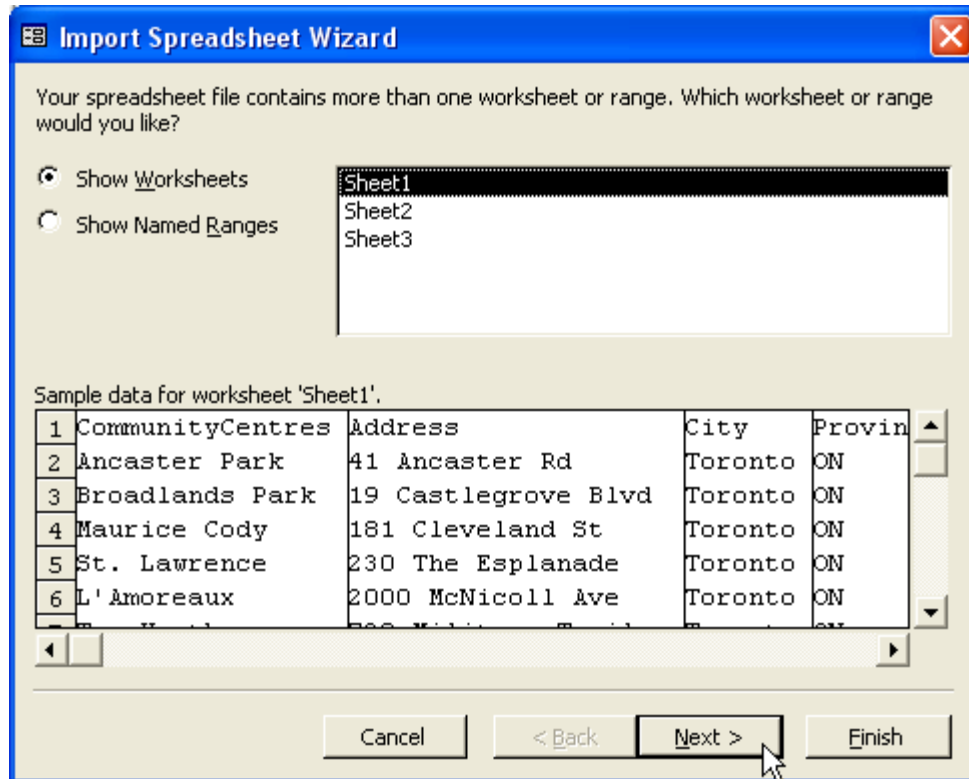
4. You will be prompted for the spreadsheet file. Make sure to select "Microsoft Excel (*.xls)" for the **Files of type** to see your file in the list. Double click on your spreadsheet file to import it.





UNIVERSITY OF TORONTO MAP & DATA LIBRARY

5. The Import Spreadsheet Wizard will take you through the steps of importing. First make sure that the correct sheet is highlighted in the list above and that your data is appearing correctly in the sample data preview window below. If everything looks okay, click on the **Next** button.





UNIVERSITY OF TORONTO MAP & DATA LIBRARY

- Put a checkmark next to “First Row Contains Column Headings” and click on the **Next** button:

Microsoft Access can use your column headings as field names for your table. Does the first row specified contain column headings?

First Row Contains Column Headings

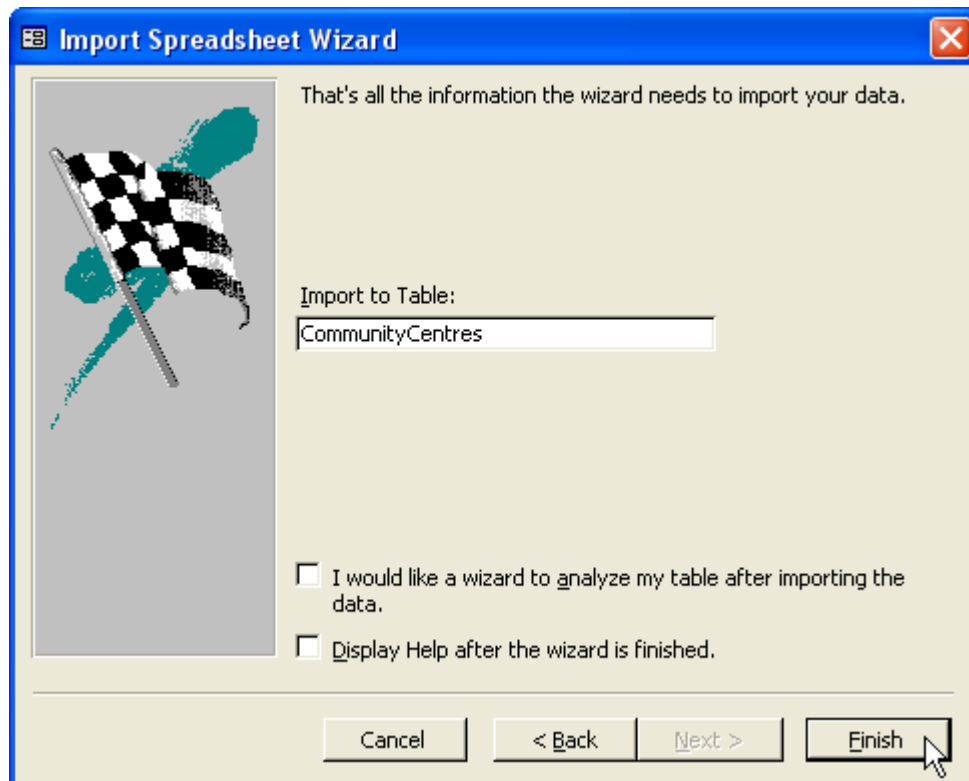
	CommunityCentres	Address	City	Provir
1	Ancaster Park	41 Ancaster Rd	Toronto	ON
2	Broadlands Park	19 Castlegrove Blvd	Toronto	ON
3	Maurice Cody	181 Cleveland St	Toronto	ON
4	St. Lawrence	230 The Esplanade	Toronto	ON
5	L'Amoreaux	2000 McNicoll Ave	Toronto	ON
6	Tam Heather	730 Military Trail	Toronto	ON

Cancel < Back Next > Finish



UNIVERSITY OF TORONTO MAP & DATA LIBRARY

7. Continue working through the wizard by clicking on the **Next** button repeatedly. You should encounter three more screens, but the defaults can be used. On the fourth and final screen, you can name the table "CommunityCentres" by filling in the **Import to Table** field. Then click on the **Finish** button to complete the import:

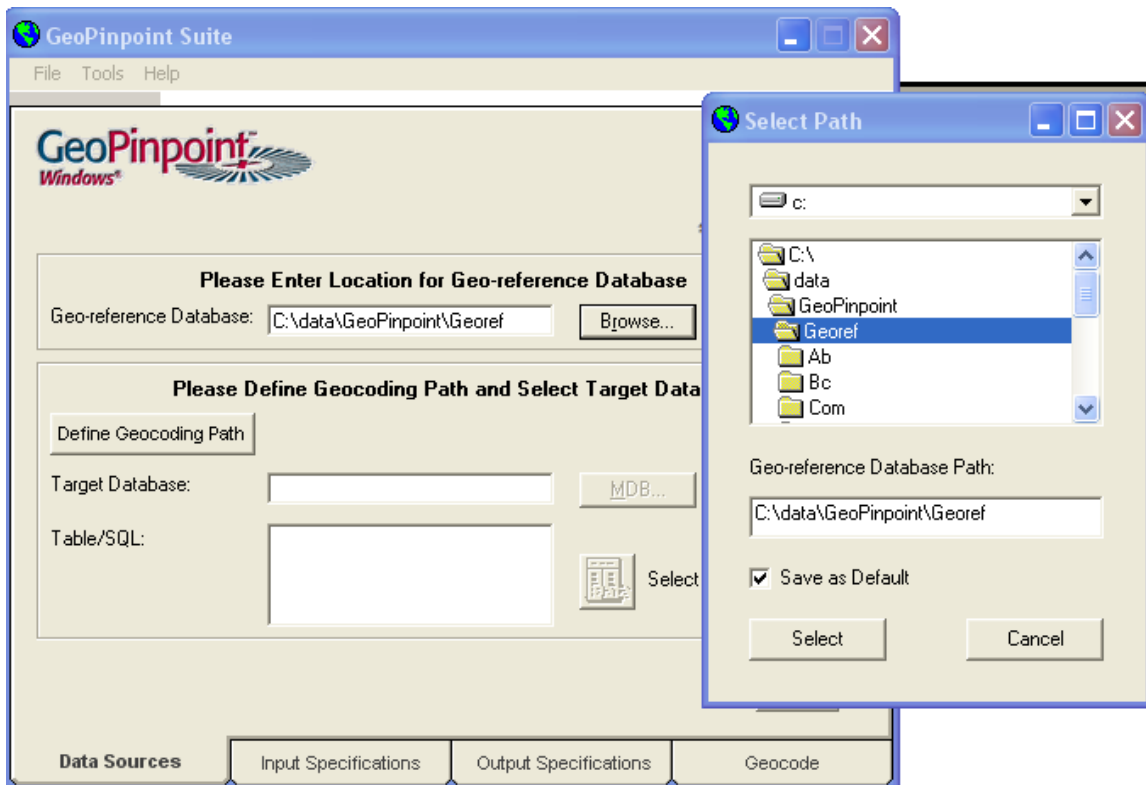


8. Once the import has completed you can exit out of Microsoft Access.

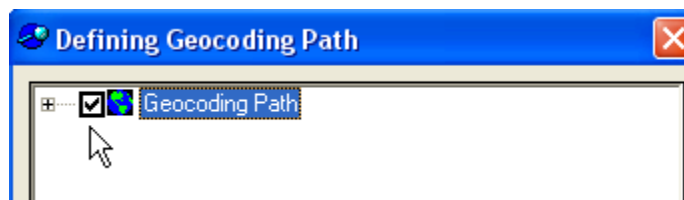


UNIVERSITY OF TORONTO MAP & DATA LIBRARY

9. Start up the GeoPinpoint program. Make sure that it is set up correctly by having a path entered for the Geo-reference Database. If this is not the case, click on the **Browse** button and browse to the correct directory. It should be something similar to “C:\data\GeoPinpoint\Georef”. Place a checkmark next to “Save as Default” and click on the **Select** button:



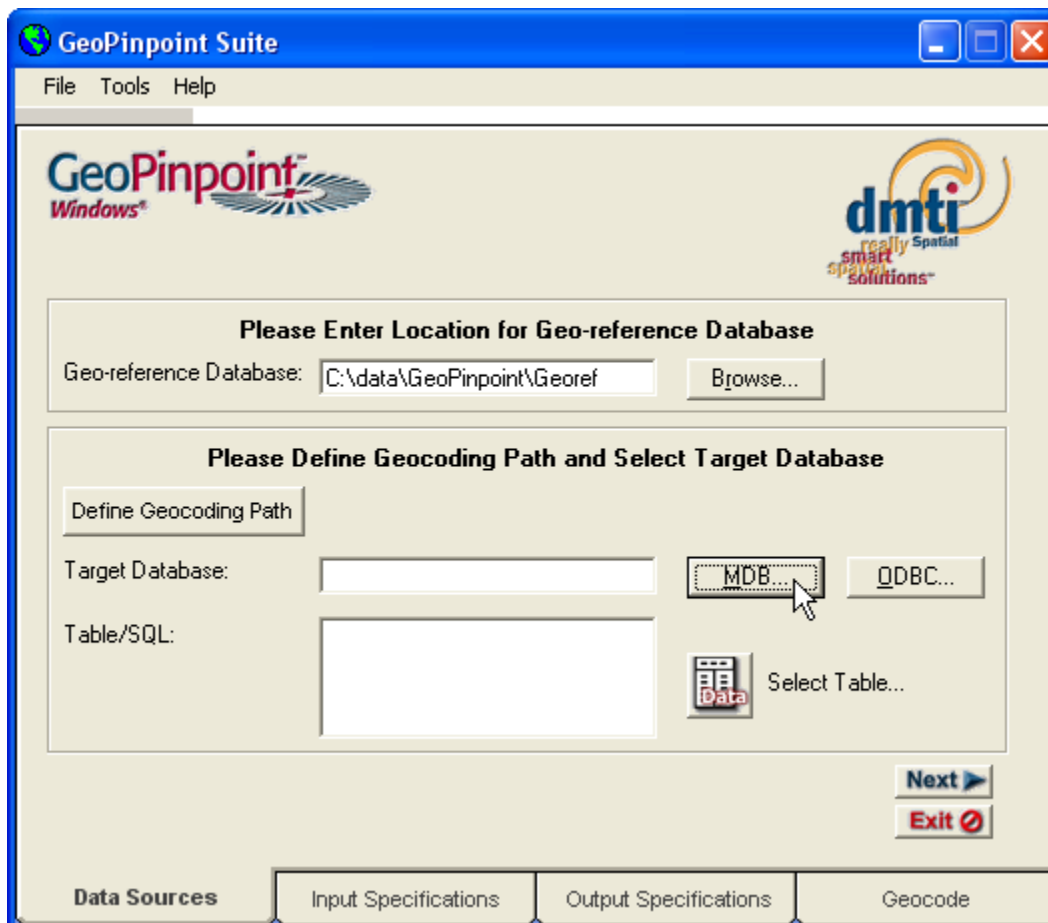
10. Click on the **Define Geocoding Path** button and make sure that there is a checkmark next to Geocoding Path. If you are asked if you want to select all geocoding targets under this Node, say “Yes.” Click on the **OK** button to close the window:





UNIVERSITY OF TORONTO
MAP & DATA LIBRARY

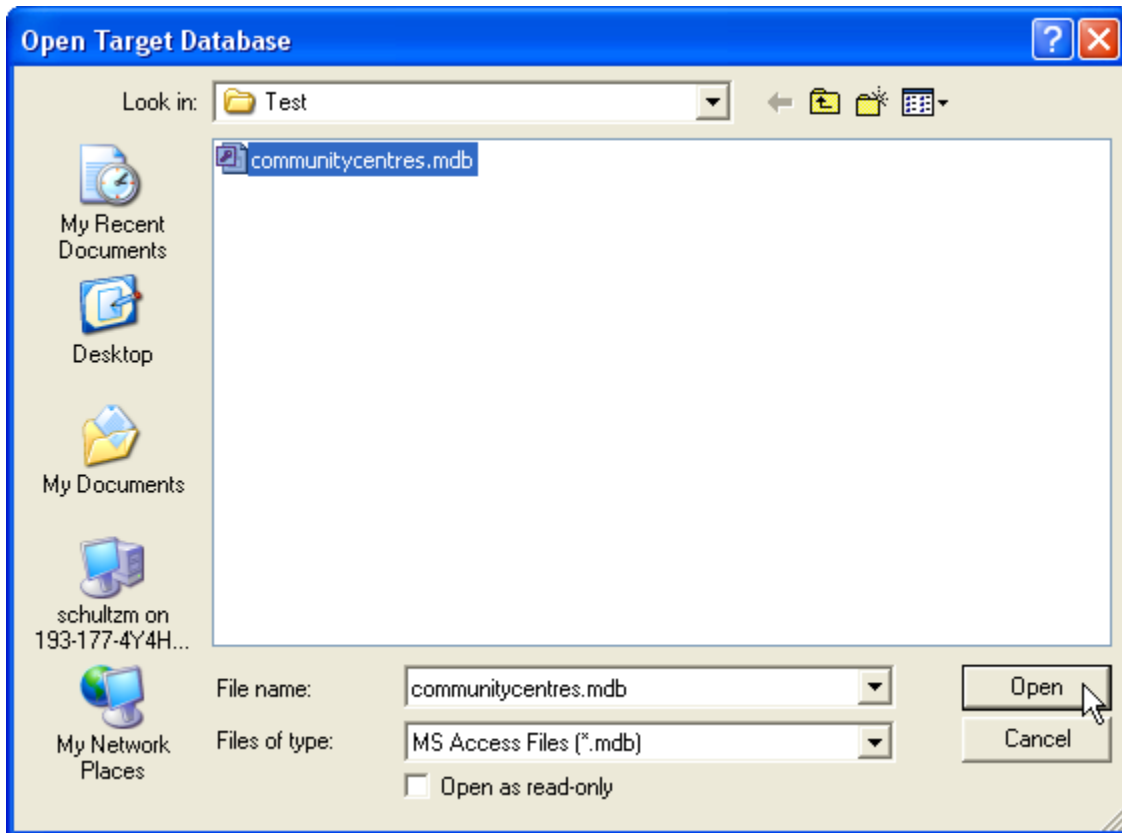
11. Click on the **MDB...** button next to the **Target Database** field to browse to your newly created database of addresses:



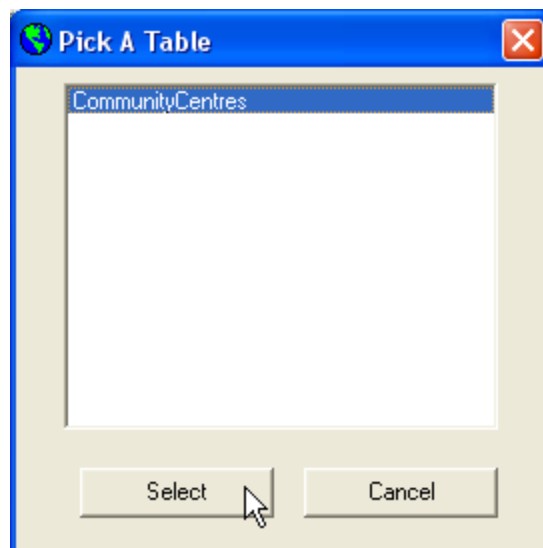


UNIVERSITY OF TORONTO
MAP & DATA LIBRARY

12. Select your database file and click on the **Open** button:



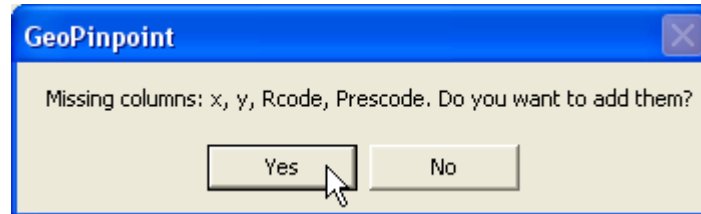
13. Choose the table name "CommunityCentres" in the database and click on the **Select** button:



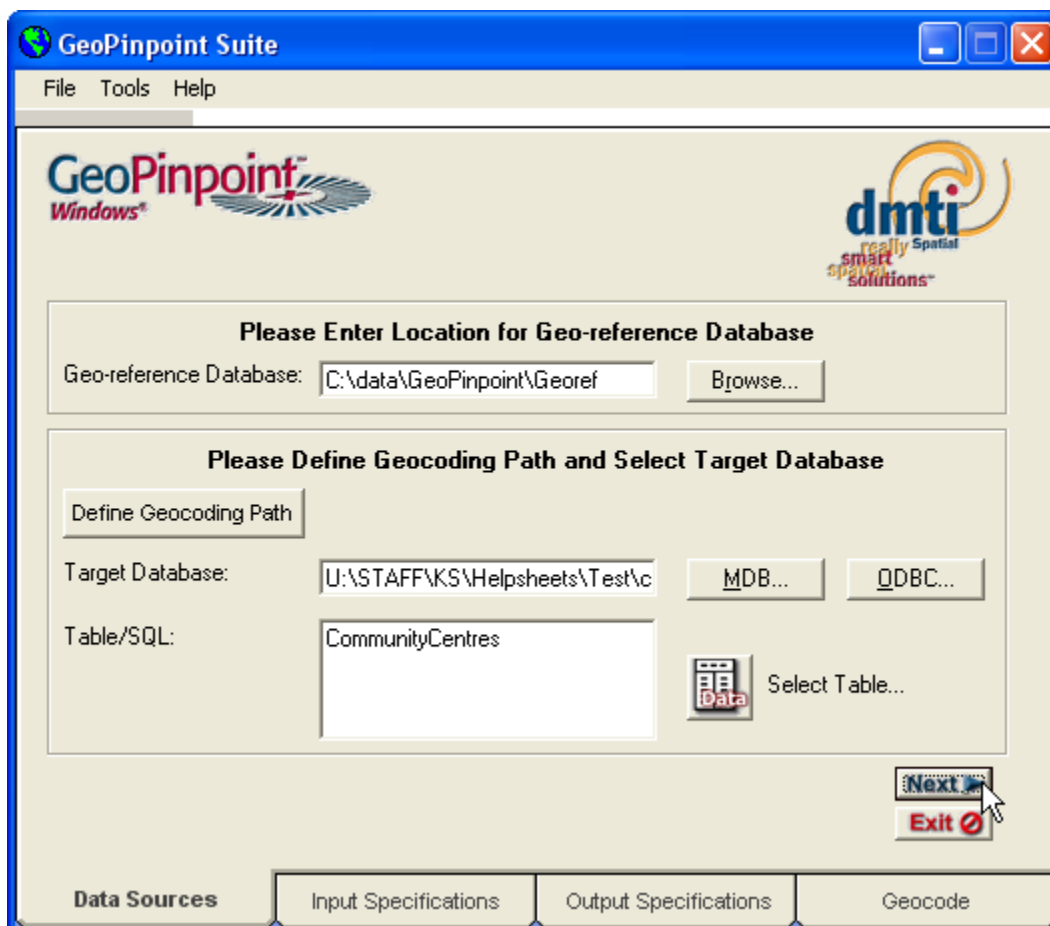


UNIVERSITY OF TORONTO
MAP & DATA LIBRARY

14. You will be asked if you want to add missing columns x, y, Rcode, and Prescode. Click on the **Yes** button:



15. You should see the path to your database filled in next to **Target Database** and your table name listed next to **Table/SQL**. Click on the **Next** button to continue:





16. GeoPinpoint's default is to use un-parsed addresses – keep this checked. In this screen, you need to give it information about your column headers and how they match up to the data that GeoPinpoint needs. For our example, we should select **Address** from the drop-down menu next to the **Un-Parsed Address** field. We should also select **City** for **Municipality**, **Province** for **Province**, and **PostalCode** for **Postal Code**. Once you have matched up fields, click on the **Next** button:

The screenshot shows the 'GeoPinpoint Suite' application window. The title bar includes 'GeoPinpoint Suite' and standard window controls. The menu bar has 'File', 'Tools', and 'Help'. The main interface features the 'GeoPinpoint Windows' logo on the left and the 'dmti really smart solutions' logo on the right. The central heading is 'Specify Address Data Fields And Options'. On the left side, there are several dropdown menus: 'Un-Parsed Address' (set to 'Address'), 'Street Number', 'Street Prefix:*', 'Street Name', 'Street Type', 'Street Direction', 'Suite:*', 'Municipality' (set to 'City'), 'Province' (set to 'Province'), and 'Postal Code' (set to 'PostalCode'). A note below these says '* Optional'. On the right side, there is a list of checkboxes: 'Use Un-Parsed Address Field' (checked), 'Parse out Prefix from Street Name', 'Use Street Prefix and Suffix Type', 'Use Street Pre-Direction', 'Use Constant for Province', 'Use Intersection Delimiter', 'Lookup Municipality via Postal Code', and 'Geocode to Street Alias'. Below these are two tabs: 'General' (selected) and 'Relax/Address'. At the bottom right, there are four buttons: 'Back', 'Next' (with a mouse cursor over it), 'Reset', and 'Exit'. At the very bottom, there are four tabs: 'Data Sources', 'Input Specifications' (selected), 'Output Specifications', and 'Geocode'.



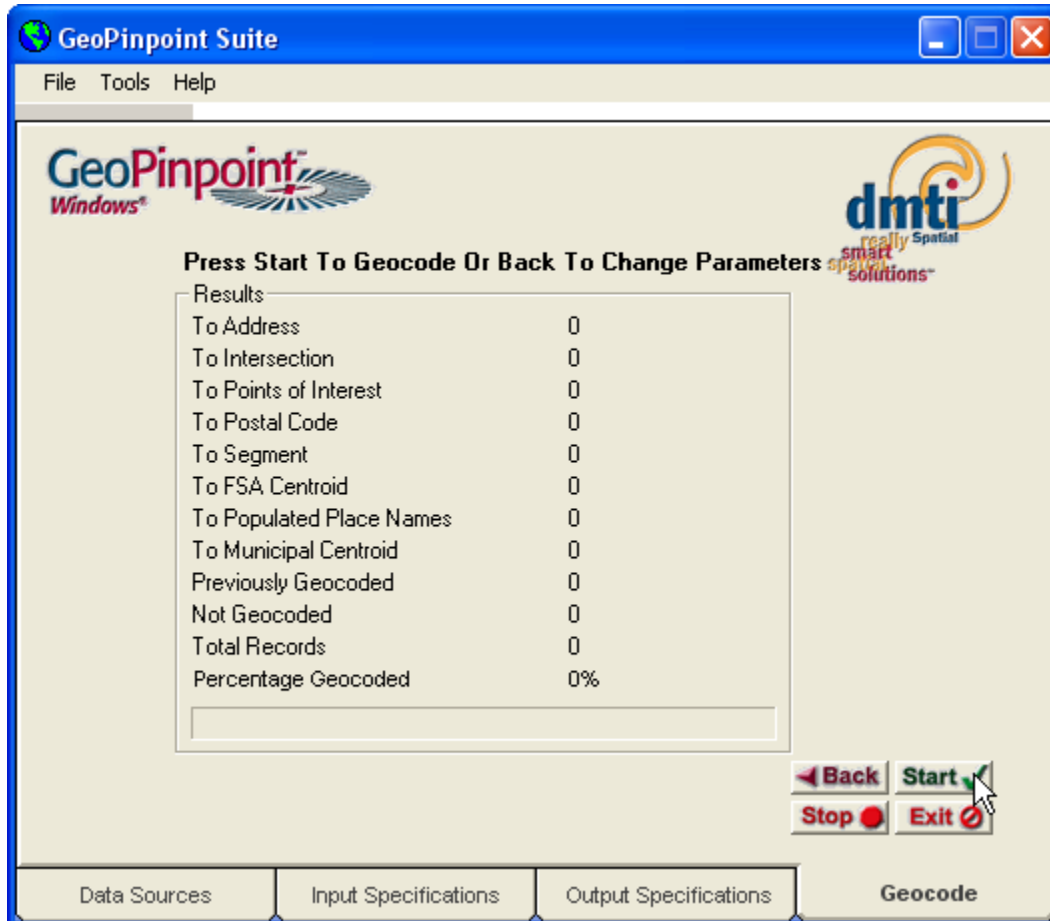
17. The next screen is telling you that four fields will be added to your database table: x, y, Rcode, and Prescode. The longitude will be outputted to field **x** and the latitude will be outputted to field **y**. You can leave the defaults as is and click on the **Next** button:

The screenshot shows the 'GeoPinpoint Suite' application window. The title bar includes the application name and standard Windows window controls. The menu bar contains 'File', 'Tools', and 'Help'. The main area features the 'GeoPinpoint Windows' logo on the left and the 'dmti really Spatial smart solutions' logo on the right. The central heading is 'Specify Output Fields And Options'. Below this, there are four dropdown menus: 'Longitude:' (set to 'x'), 'Latitude:' (set to 'y'), 'Result Code:' (set to 'Rcode'), and 'Precision Code:' (set to 'Prescode'). To the right of these are two grouped sections: 'Output Options' with a checkbox for 'Overwrite Existing Coordinates' (unchecked), 'Offset from Centreline (m):' (set to 10), and 'Inset from Centreline (m):' (set to 0); and 'Geocode Options' with a checkbox for 'Interactive Geocoding is Required' (unchecked). At the bottom right, there are three buttons: 'Back', 'Next', and 'Exit'. The 'Next' button is highlighted with a mouse cursor. At the very bottom, a tabbed interface shows four tabs: 'Data Sources', 'Input Specifications', 'Output Specifications' (which is the active tab), and 'Geocode'.



UNIVERSITY OF TORONTO
MAP & DATA LIBRARY

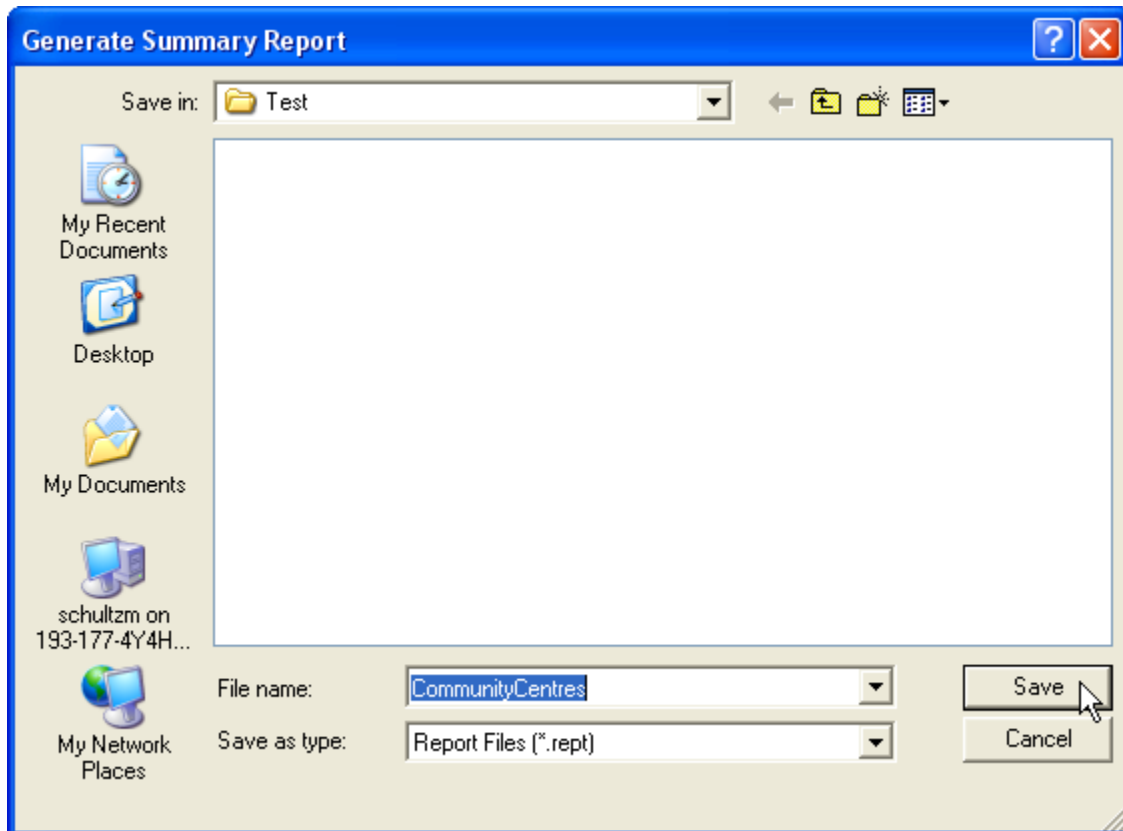
18. Click on the **Start** button to start geocoding your addresses. A window will popup to say when it is done. Click on the **OK** button.





UNIVERSITY OF TORONTO MAP & DATA LIBRARY

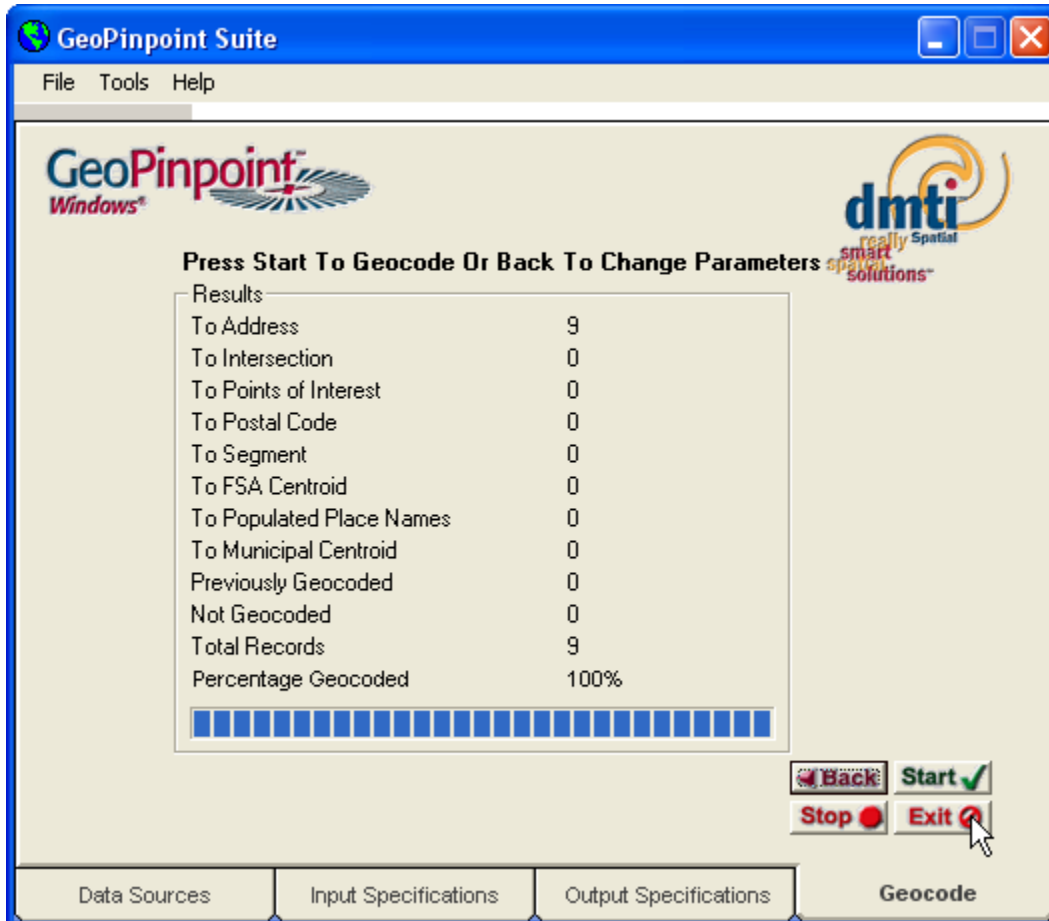
19. GeoPinpoint will provide you with a summary report of the geocoding process. It will prompt you for where to save it. Browse to where you want to save it, give it a name (if it does not have one already), and click on the **Save** button.





UNIVERSITY OF TORONTO
MAP & DATA LIBRARY

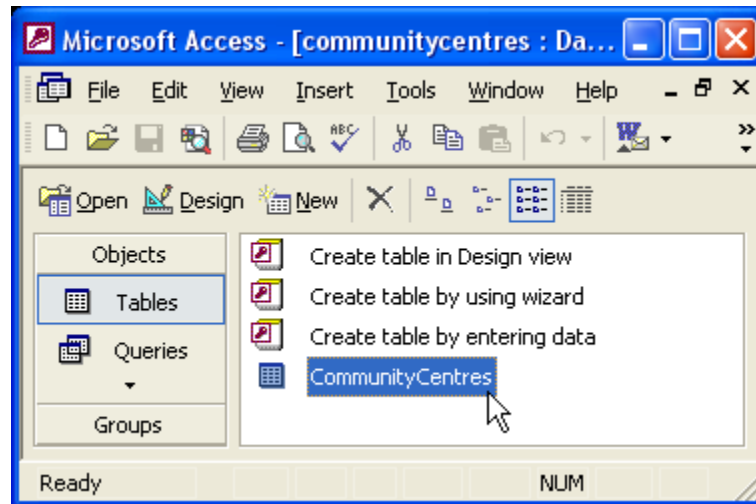
20. This window will give you a summary of how the process went. Click on the **Exit** button to close the program:





UNIVERSITY OF TORONTO MAP & DATA LIBRARY

21. To see how your file has changed, double click on your database file, and then double click on your table name to open up the table and view the data.



22. You should see four additional columns of data, including longitude (x) and latitude (y) columns:

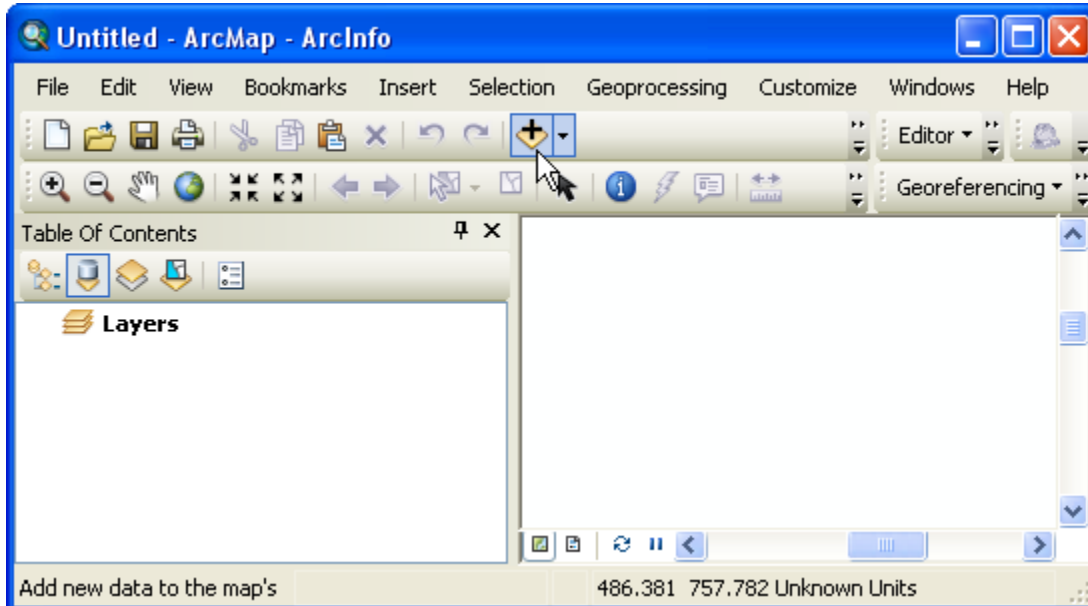
The screenshot shows the Microsoft Access interface with the "CommunityCentres" table open in Datasheet View. The title bar reads "Microsoft Access - [CommunityCentres : Table]". The menu bar includes File, Edit, View, Insert, Format, Records, Tools, Window, and Help. The ribbon shows various data manipulation options. The table has 11 columns: ID, CommunityCent, Address, City, Province, PostalCode, x, y, Rcode, and Prescode. The status bar at the bottom indicates "Record: 10 of 10" and "Datasheet View".

ID	CommunityCent	Address	City	Province	PostalCode	x	y	Rcode	Prescode
1	Ancaster Park	41 Ancaster Rd	Toronto	ON	M3K1S7	-79.465836444	43.7320327156	111060121	5
2	Broadlands Parl	19 Castlegrove	Toronto	ON	M3A1K9	-79.323516790	43.7450771869	111060121	5
3	Maurice Cody	181 Cleveland S	Toronto	ON	M4S3C1	-79.378585571	43.7053414536	111010121	5
4	St. Lawrence	230 The Esplan	Toronto	ON	M5A4J6	-79.365094855	43.6496117405	111010121	5
5	L'Amoreaux	2000 McNicoll A	Toronto	ON	M1V5E9	-79.302117604	43.8121709493	111060121	5
6	Tam Heather	730 Military Trai	Toronto	ON	M1E4P7	-79.20055292	43.7907236262	111060121	5
7	Scadding Court	707 Dundas St	Toronto	ON	M5T2W6	-79.40511889	43.6521722144	111010121	5
8	Fairmount Park	90 Bowmore Rd	Toronto	ON	M4L3J2	-79.314560373	43.6768684670	111010121	5
9	John Innes	150 Sherbourne	Toronto	ON	M5A2R6	-79.370166429	43.6560125483	111010121	5



UNIVERSITY OF TORONTO MAP & DATA LIBRARY

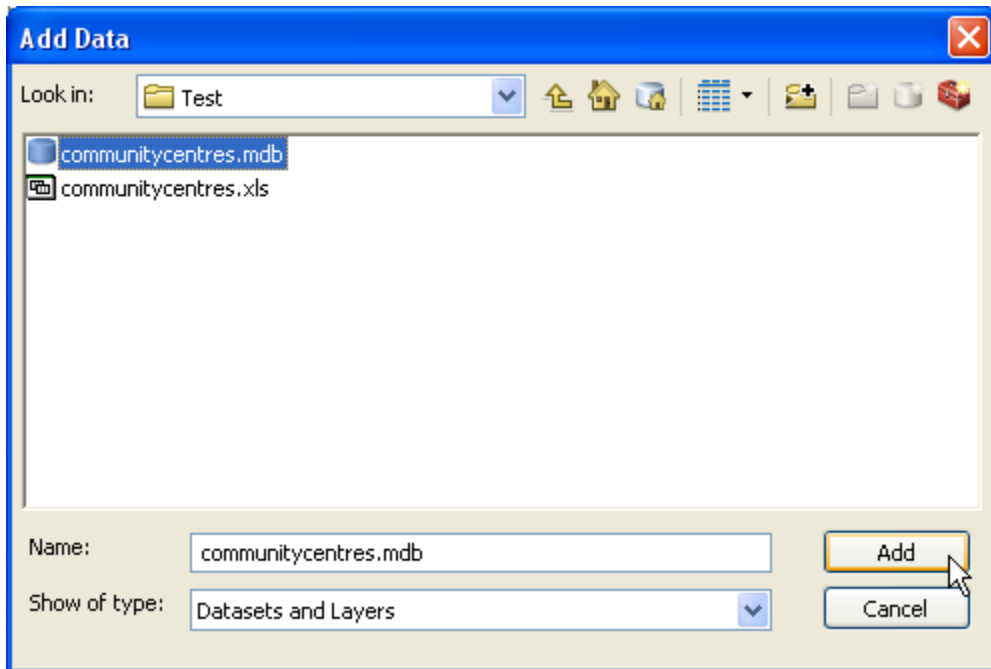
23. To display these points on a map, we can use ArcMap. Close Microsoft Access and open up ArcMap. Using a blank map template, click on the **Add Data** icon:



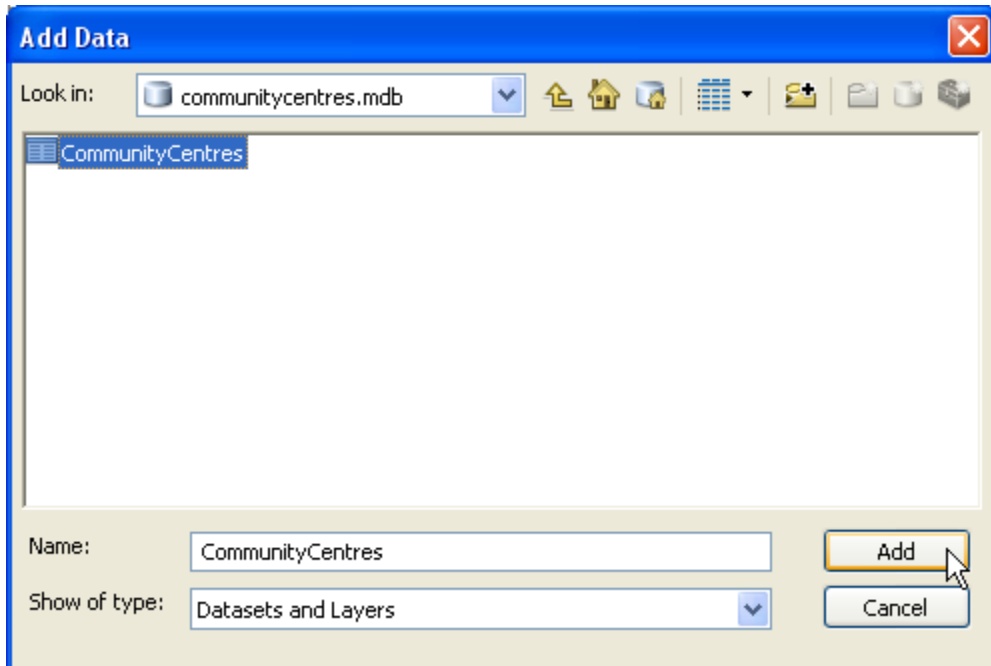


UNIVERSITY OF TORONTO MAP & DATA LIBRARY

24. Browse to and select the database file and click on the **Add** button;



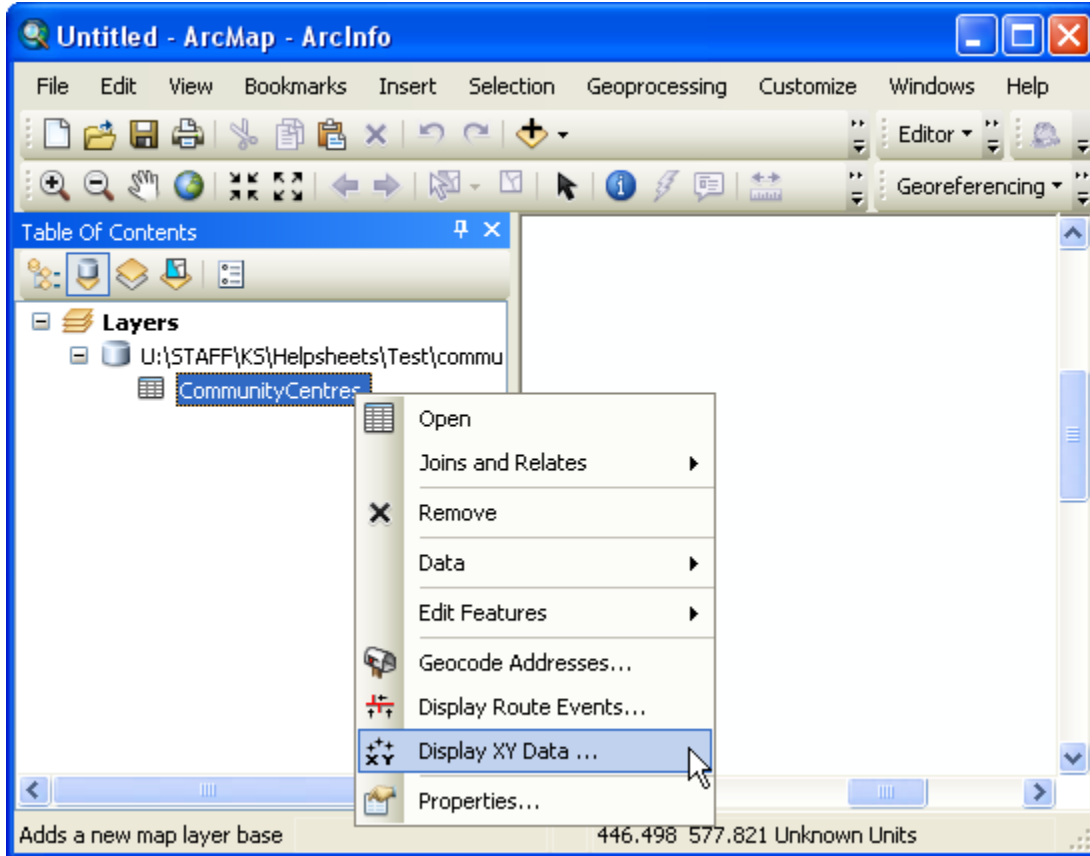
25. You will then be prompted to select the table you want to add. Select "CommunityCentres" and click on the **Add** button:





UNIVERSITY OF TORONTO MAP & DATA LIBRARY

26. Right click on “CommunityCentres” in the Table of Contents left sidebar and select **Display XY Data ...**





UNIVERSITY OF TORONTO MAP & DATA LIBRARY

27. A window opens showing that the X field in ArcMap matches the x column in our database table and the Y field matches the y column; however, it also says that the Coordinate System is unknown. To correct this so that the map will display correctly, click on the **Edit...** button:

Display XY Data [?] [X]

A table containing X and Y coordinate data can be added to the map as a layer

Choose a table from the map or browse for another table:

CommunityCentres [v] [Browse]

Specify the fields for the X, Y and Z coordinates:

X Field: x [v]

Y Field: y [v]

Z Field: <None> [v]

Coordinate System of Input Coordinates

Description:

Unknown Coordinate System

Show Details

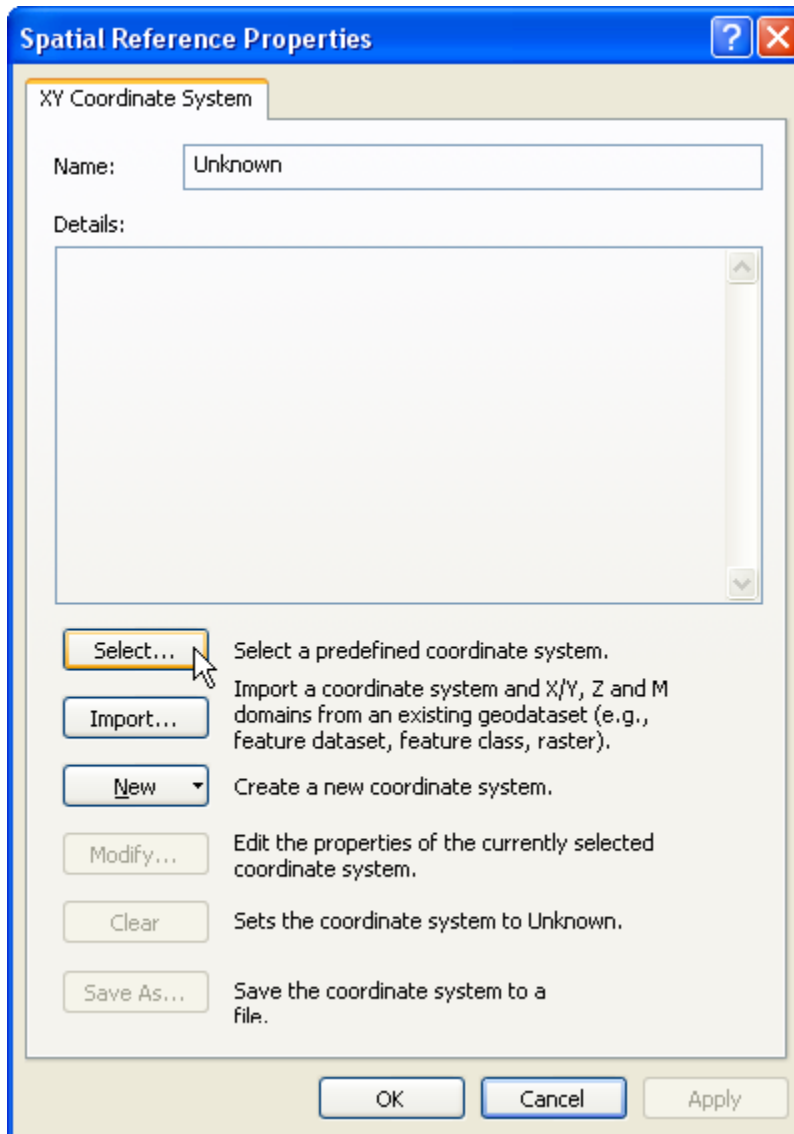
Edit... [Mouse cursor]

Warn me if the resulting layer will have restricted functionality

OK Cancel



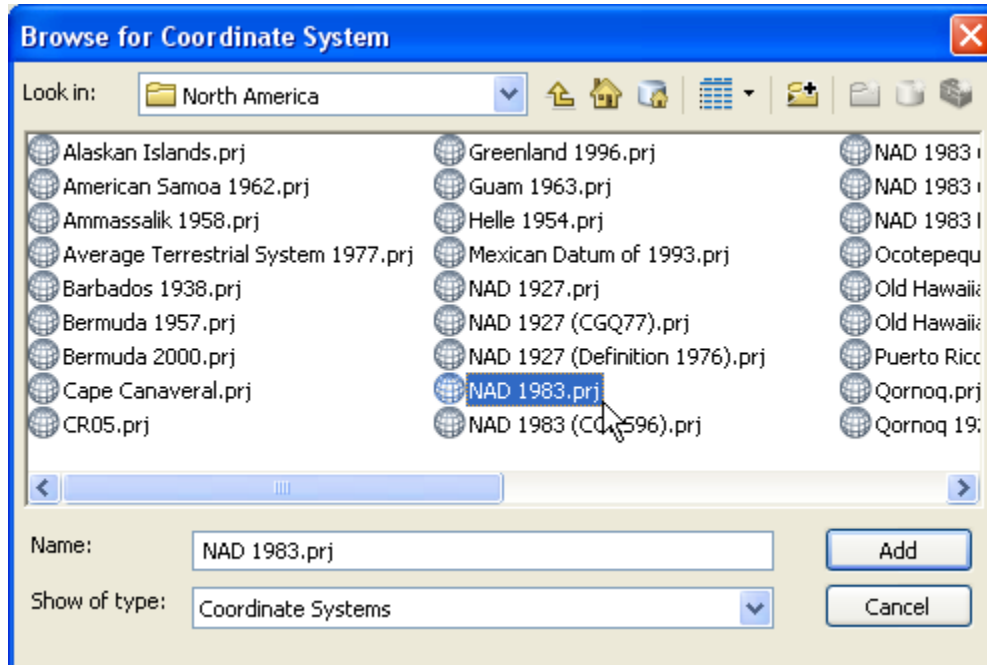
28. Click on the **Select...** button:





UNIVERSITY OF TORONTO MAP & DATA LIBRARY

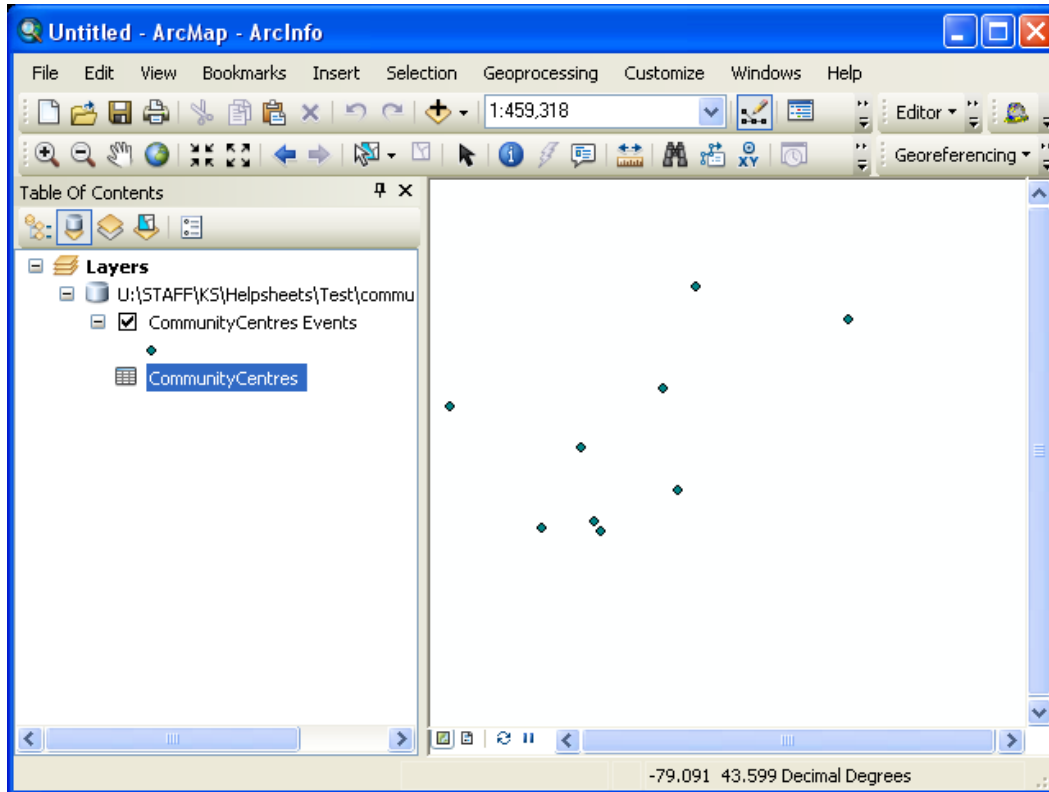
29. Browse to Geographic Coordinate Systems\North America\ and double click on NAD 1983.prj (what GeoPinpoint uses):





UNIVERSITY OF TORONTO MAP & DATA LIBRARY

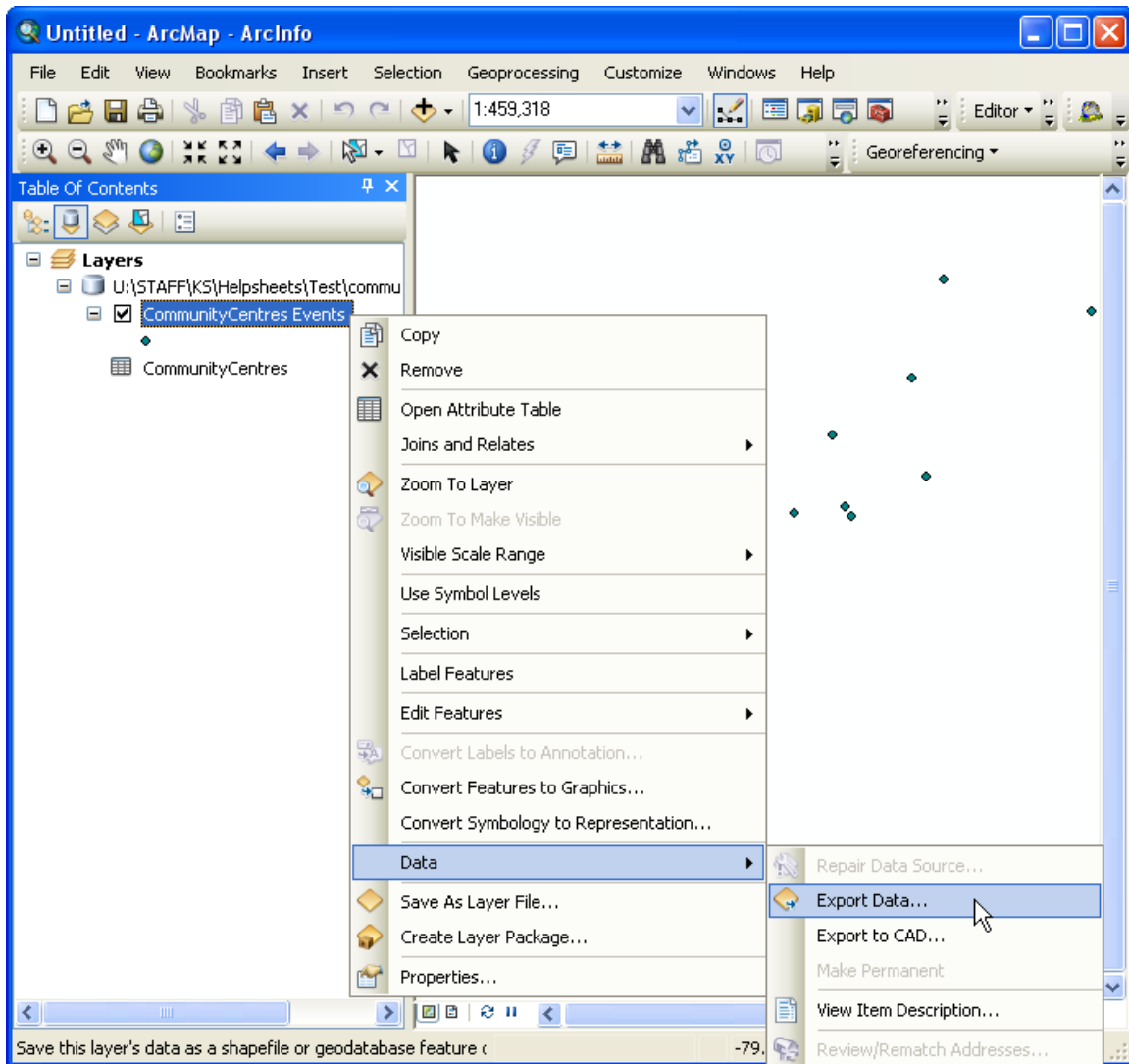
30. Click on the **OK** button. Then click again on the **OK** button to complete the map display. You should now see points on your map, similar to this:





UNIVERSITY OF TORONTO MAP & DATA LIBRARY

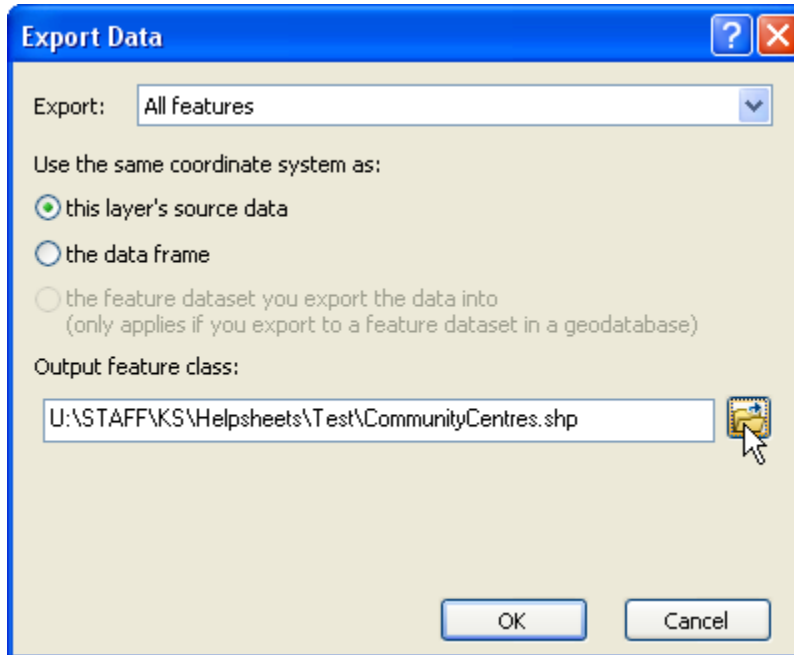
31. Finally, we need to export it as a shapefile to save the changes we made in ArcMap. Right click on “CommunityCentres Events” and select **Data->Export Data...**



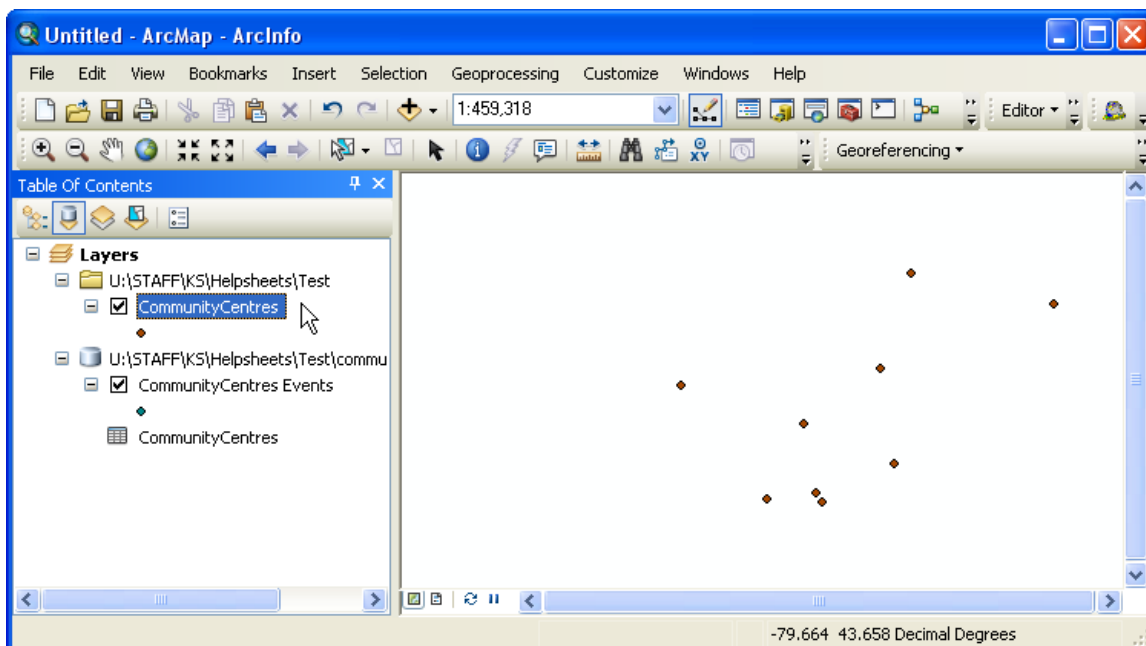


UNIVERSITY OF TORONTO MAP & DATA LIBRARY

32. Click on the folder to browse to where you want to save the shapefile and give the shapefile a name. Then click on the **OK** button:



33. You will be prompted to add the exported data as a layer, say **Yes**. Now you have a shapefile with points representing each address you had in your original Excel spreadsheet:





UNIVERSITY OF TORONTO
MAP & DATA LIBRARY

You have now geocoded addresses using GeoPinpoint and displayed them as points in ArcMap.

If you have any questions or comments, please contact us at
gis.maps@utoronto.ca.

U:\staff\docs\Help Sheets and Workshops\Geocoding Tutorial using GeoPinpoint
Suite.doc

<http://maps.library.utoronto.ca/docs/GeocodingGeoPinpoint.pdf>