

Plotting Ellipses

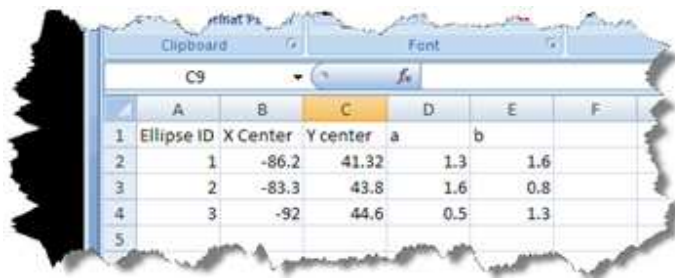
Occasionally, you need to plot your data in ellipses in one or more locations. You can use a map or an x-y scatter-plot.

You will need to setup the data, join the tables, create calculated fields, and setup the views. The first example will show the ellipses border. You can also setup the same layout with filled ellipses.

Setting up the Data

Since each data set will be stored differently, we will explain how to setup the data not the data itself.

Your table must contain at least columns representing the Ellipse ID, X Center, Y Center, Width Coefficient, and Height Coefficient. You may also have an optional field for the rotation angle of the ellipse. This must be in Radians.



	A	B	C	D	E	F
1	Ellipse ID	X Center	Y center	a	b	
2	1	-86.2	41.32	1.3	1.6	
3	2	-83.3	43.8	1.6	0.8	
4	3	-92	44.6	0.5	1.3	
5						

Ellipse ID: Some kind of identifier for each ellipse you wish to plot

X Center: The X coordinate (or Longitude) for the center of the ellipse

Y Center: The Y coordinate (or Latitude) for the center of the ellipse

a: Coefficient for the Width of the ellipse

b: Coefficient for the Height of the ellipse

(optional) phi: the rotation angle of the ellipse (in Radians)verging is used by default when the range of a measure includes both positive and negative values. Here 'Gross Profit' is on the color shelf:

Your second table must contain the time variable to parameterize each ellipse. Remember if you are using Excel, you must use a new tab in the same Excel file.

In this new table, you must have a time field. The recommended range is from -100 to 100. Making the range larger will make the ellipses smoother. Making the range smaller will make the ellipses more jagged.

Each range must be repeated for each ellipses ID.

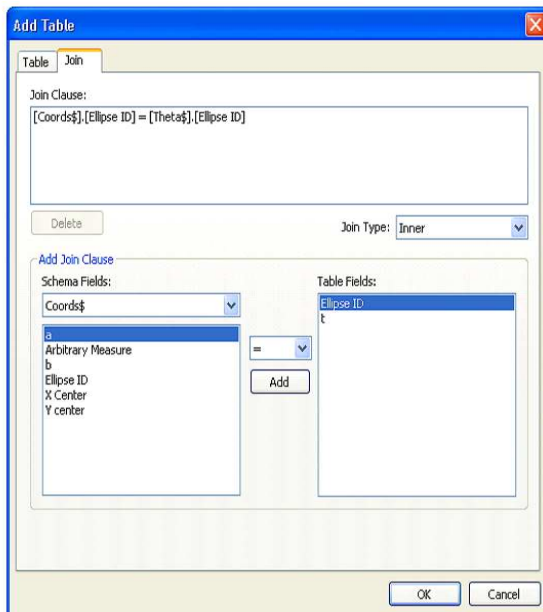
In this example, you will plot 3 ellipses. So you will need rows for -100 to 100 repeated 3 times. This will be 603 rows.

	A	B	C
1	t	Ellipse ID	
2		-100	1
3		-99	1
4		-98	1
5		-97	1
6		-96	1
7		-95	1
8		-94	1
9		-93	1
10		-92	1
11		-91	1
12		-90	1
13		-89	1
14		-88	1
15		-87	1
16		-86	1
17		-85	1

Creating the Join

After the tables are created, open Tableau and connect to the first table.

In the data connection, change the option from **Single Table** to **Multiple Tables**. The join should be automatically set to the Ellipses ID if you named the fields the same. If not, modify the join to be only the Ellipses ID



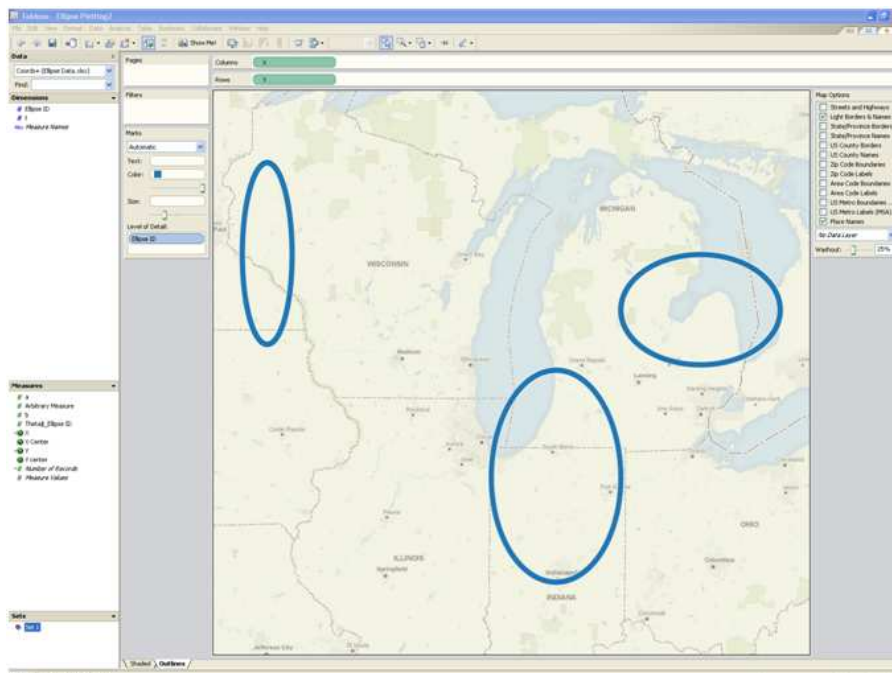
Creating the Calculated Fields

1. Right click in the **Measure window**.
2. Choose Create Calculated Field.
3. Call this calculated field X.
4. Use one of the two formulas
5. $[X\ Center] + [a] * \cos([t] / 100 * \pi())$
6. (optional, if you are rotating your ellipses by an angle 'phi'):
7. $[X\ Center] + [a] * \cos([t] / 100 * \pi()) * \cos([\phi]) - [b] * \sin([t] / 100 * \pi()) * \sin([\phi])$
8. Click OK.
9. Right click in the **Measure window**.
10. Choose Create Calculated Field.
11. Call this calculated field Y.
12. Use one of the two formulas
13. $[Y\ Center] + [b] * \sin([t] / 100 * \pi())$
14. (optional, if you are rotating your ellipses by an angle 'phi'):
15. $[Y\ Center] + [b] * \cos([t] / 100 * \pi()) * \sin([\phi]) + [a] * \sin([t] / 100 * \pi()) * \cos([\phi])$
16. Click OK.

Creating the View

Now you can build your view. If you are using Latitude and Longitude data, make sure you right click the calculated field called X. Choose **Geographic Role > Longitude**. You will need to also right click the calculated field called Y. Choose **Geographic Role > Latitude**.

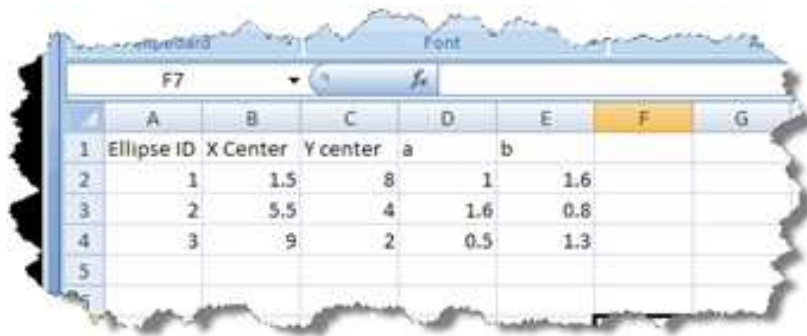
1. Move the calculated field X on to the **Columns shelf**.
2. Right click on X and choose **Dimension**.
3. Move the calculated field Y on to the **Rows shelf**.
4. Right click on Y and choose **Dimension**.
5. Move Ellipses ID to Level of Detail shelf or the Color shelf.



Changing the Layout to Filled Ellipses

The only difference between the standard ellipses and the filled in ellipses is how you create the view.

In this example, you can change the first table to show ellipses that are not on a map.



	A	B	C	D	E	F	G
1	Ellipse ID	X Center	Y center	a	b		
2	1	1.5	8	1	1.6		
3	2	5.5	4	1.6	0.8		
4	3	9	2	0.5	1.3		
5							

Setup the data connection and the calculated fields as discussed previously.

If you are using Latitude and Longitude data, make sure you right click the calculated field called X. Choose **Geographic Role > Longitude**. You will need to also right click the calculated field called Y. Choose **Geographic Role > Latitude**.

1. Move the calculated field X on to the **Columns shelf**.
2. Right click on X and choose **Dimension**.
3. Move the calculated field Y on to the **Rows shelf**.
4. Right click on Y and choose **Dimension**.
5. Change the **Marks** to **Polygon**.
6. Move field t to **Path shelf**.
7. Move Ellipses ID to **Color shelf**.

