

Using RockWorks to Create Wind-Rose Maps

12/23/24

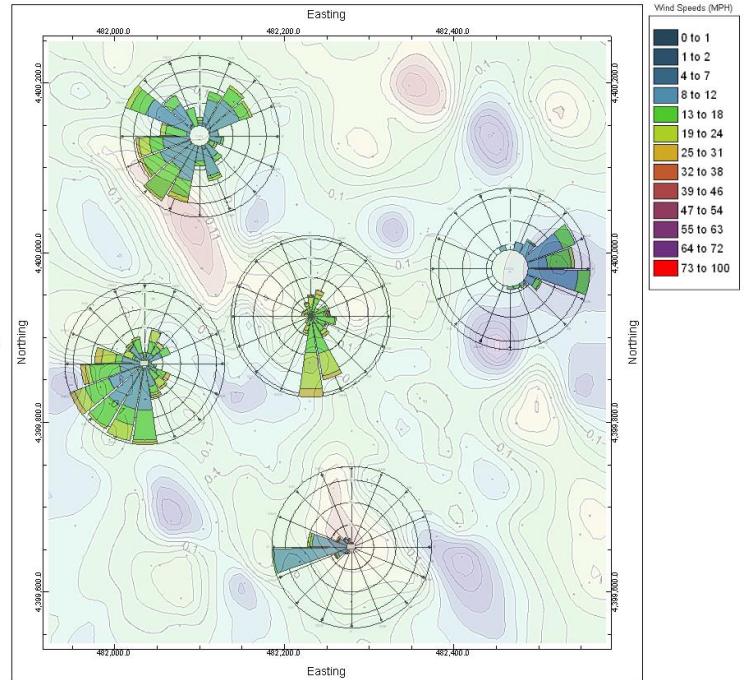
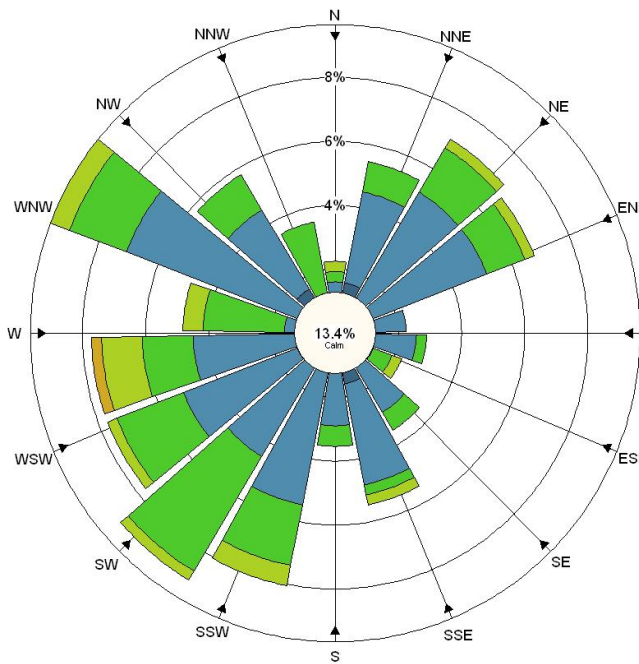


Figure 1

This step-by-step tutorial demonstrates how to use RockWorks to create a map (Figure 1) featuring rose diagrams that depict wind directions at one or more data collection sites. The radii of the petals are proportional to the relative percentages, while the color of the petal bands represent the wind speed.

Start by selecting the *Wind Roses* program from the *Utilities / Maps* pull-down menu (Figure 2).

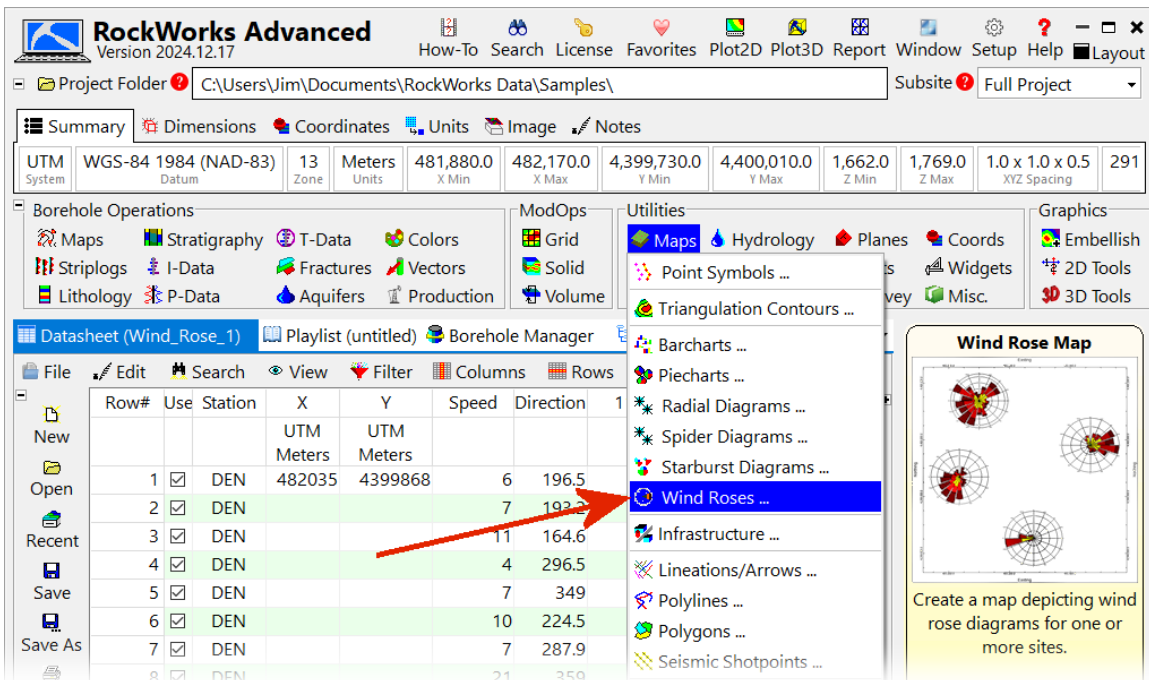


Figure 2

Click on the *Example* option at the top of the *Wind Rose Map* menu (Figure 3) and select the “*Wind_Rose_1.RwDat*” file.

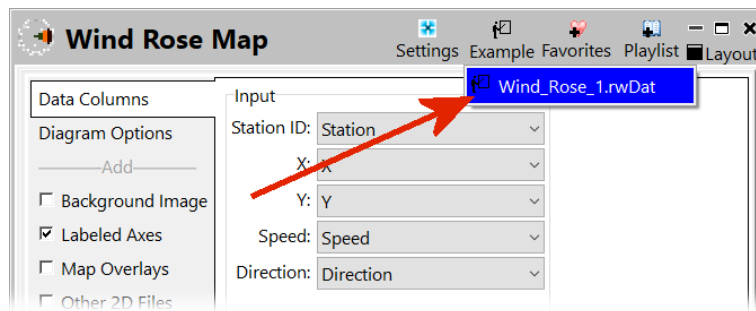


Figure 3

This will load a sample file into the *RockWorks Datasheet* (Figure 4). This file contains a list of wind speeds and directions recorded at four different sites. These sites are defined within the column titled “*Station*”. The station coordinates are defined within the *X* and *Y* columns. Please note that you only need to the stations coordinates once for each station. The program will assign the coordinates to a station the first time that a new station is encountered as it processes the *Datasheet* from the top to the bottom. If a station has no coordinates, it’s location will be assumed to be $X=0, Y=0$.

Row#	Use	Station	X	Y	Speed	Direction
			UTM Meters	UTM Meters		
1	<input checked="" type="checkbox"/>	DEN	482035	4399868	6	196.5
2	<input checked="" type="checkbox"/>	DEN			7	193.2
3	<input checked="" type="checkbox"/>	DEN			11	164.6
4	<input checked="" type="checkbox"/>	DEN			4	296.5
5	<input checked="" type="checkbox"/>	DEN			7	349
6	<input checked="" type="checkbox"/>	DEN			10	224.5
7	<input checked="" type="checkbox"/>	DEN			7	287.9
8	<input checked="" type="checkbox"/>	DEN			21	359
9	<input checked="" type="checkbox"/>	DEN			11	227.4

Figure 4

Please note that a *Datasheet* can be created from scratch, imported from an existing file (e.g., *Excel*), or copy/pasted from the *Windows Clipboard*.

Next, select the *Data Columns* tab from the *Wind Rose Map* program menu (Figure 5) and set the *Input* columns such that they refer to the proper columns within the *Wind_Rose_1.RwDat* datasheet. This requirement eliminates the need to move columns with the *Datasheet* to accommodate the program.

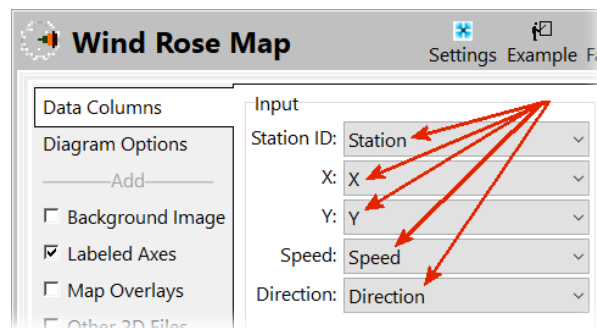


Figure 5

Now, select the *Diagram Options* and click on the *Dimensions* tab (Figure 6).

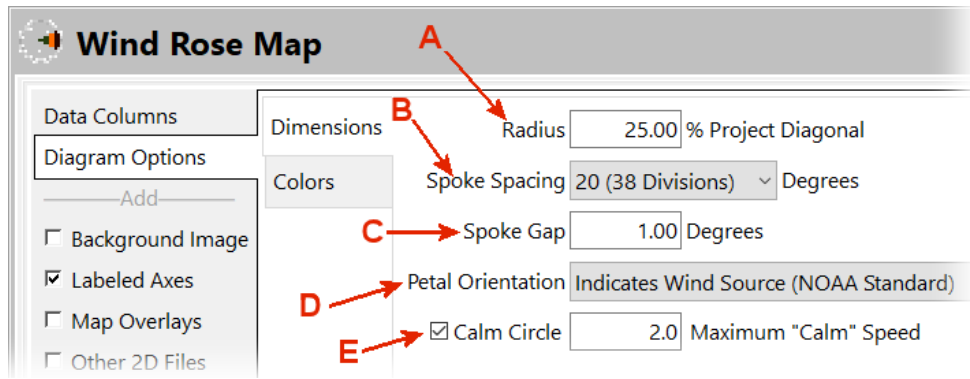


Figure 6

The items within the Dimension tab (Figure 6) are described as follows;

- A. The **Radius** is used to define the radii of the wind roses within the map output. These radii are defined as a percentage of the “Project Diagonal” which is the distance from the southwest corner of the project to the northeast corner of the project as defined within the main *Project / Dimensions* tab. Figure 7 depicts two examples.

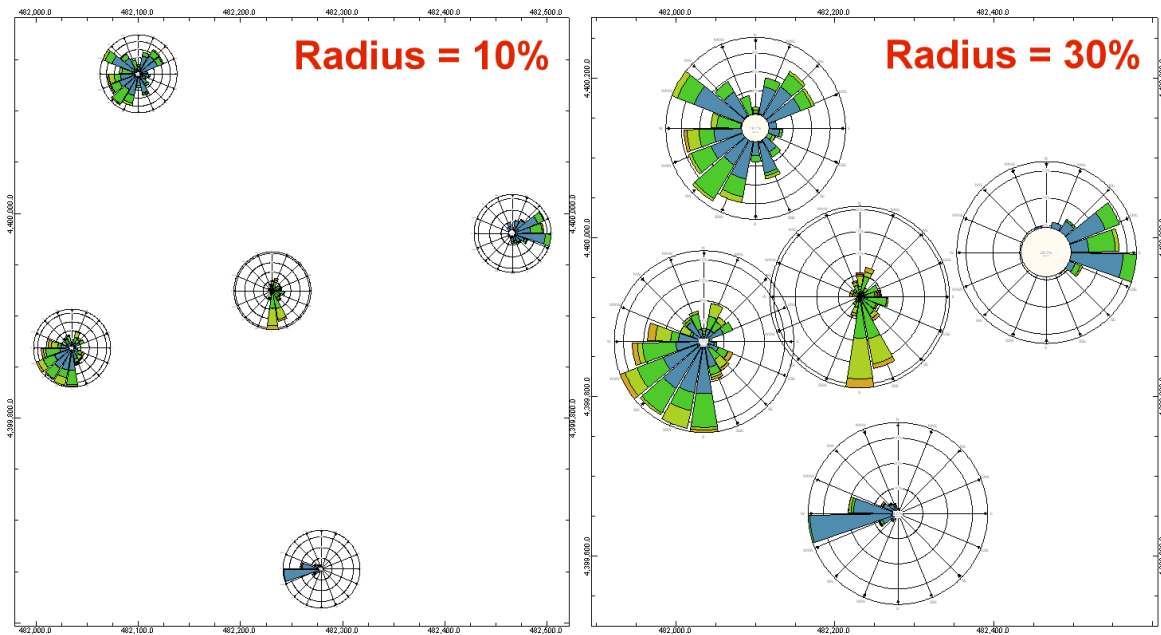


Figure 7

- B. The **Spoke Spacing** (Figure 8) defines the angle of the “pie slices” that are used to create the rose diagrams.

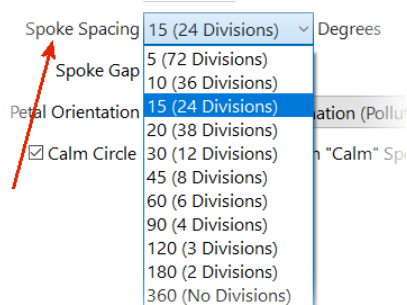


Figure 8

This provides a means for defining the “granularity” of what you’re trying to show. For example, the 360° diagram within Figure 9 shows the average speeds for all wind as color bands.

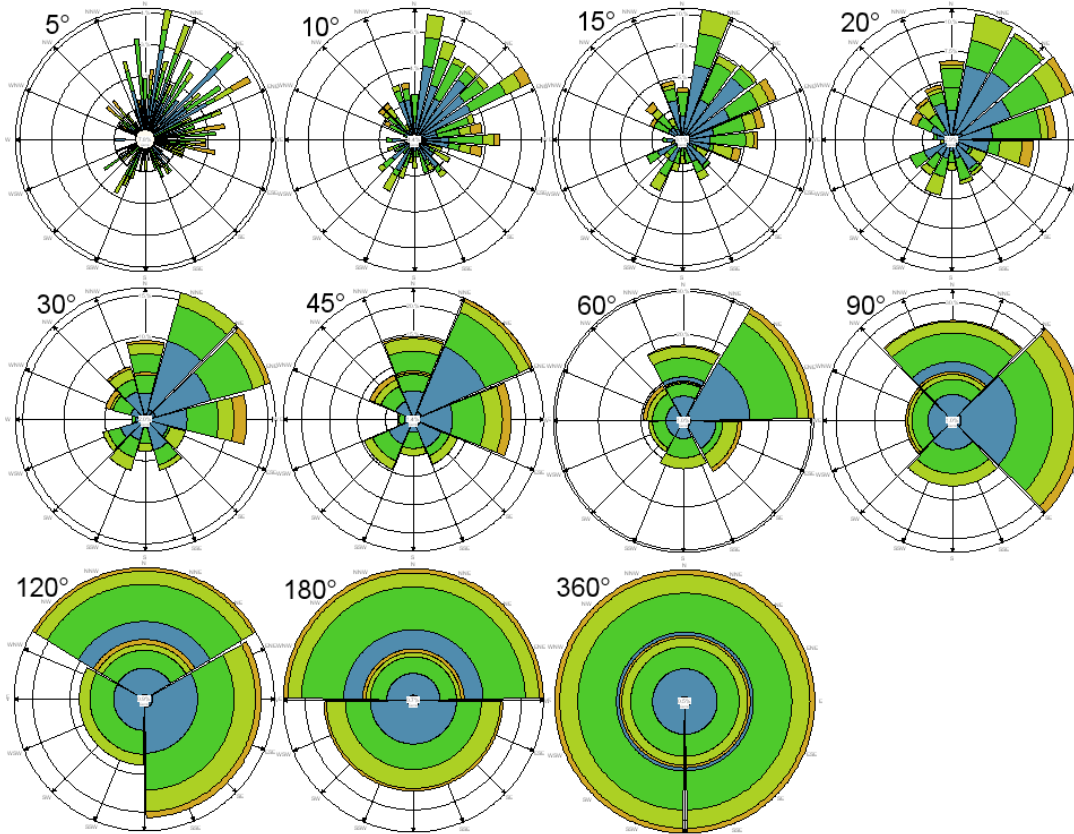


Figure 9

C. The **Spoke Gap** defines the space, in degrees, between the rose petals (Figure 10).

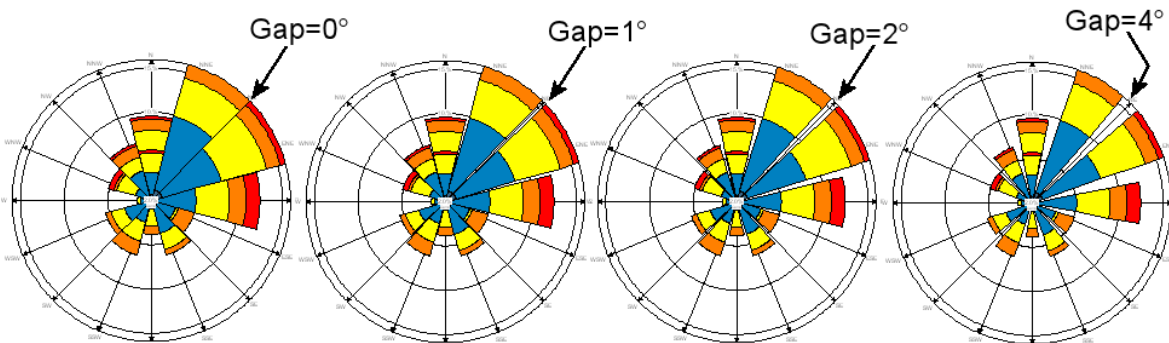


Figure 10

D. The **Petal Orientation** (Figure 11) defines if the rose petals should extend toward the direction that the wind is coming from or in the direction that the wind is blowing to. Weather scientists prefer that petals increase towards the wind source whereas pollution studies typically produce wind roses in which the petal increase their radii in the direction that the pollution is migrating.

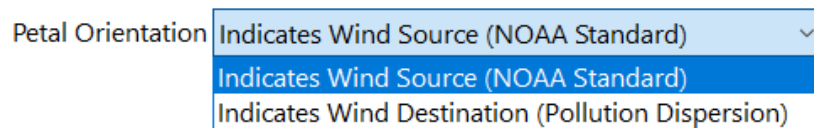


Figure 11

In addition to flipping the directions, the program plots small black arrows around the perimeter of the rose diagram (Figure 12) to indicate which direction the wind is coming from or going to.

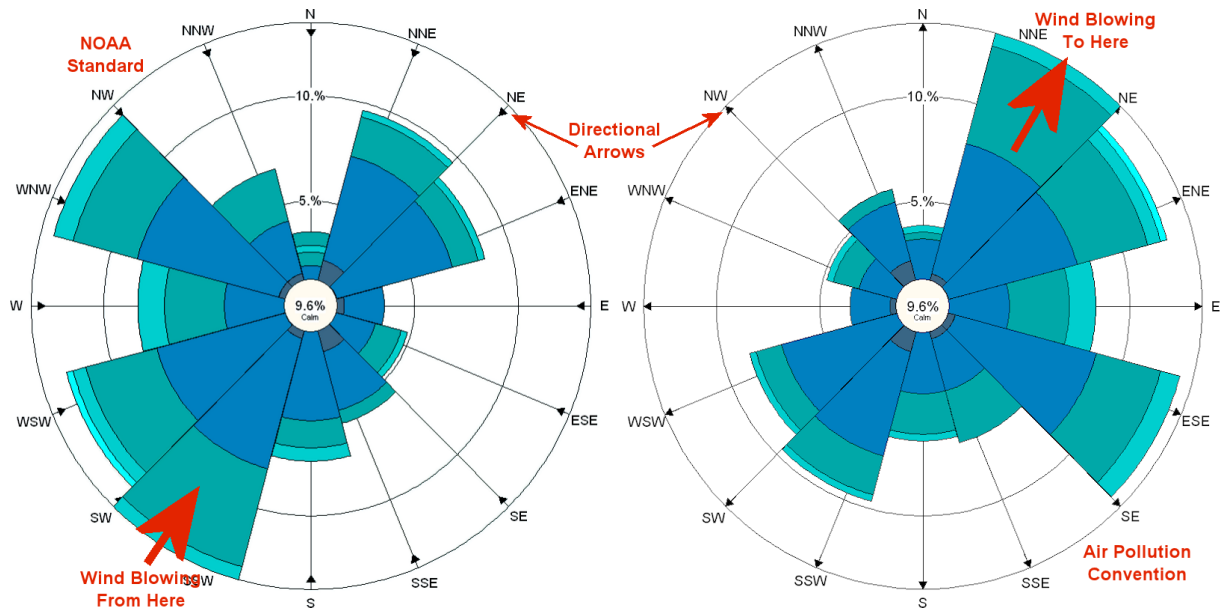


Figure 12

- E. The **Calm Circle**, if enabled, will plot a proportionally-sized circle depicting all of the wind observations that fall below a defined threshold (Figure 13). It is a safe place that is not triggered by micro-aggressive breezes.

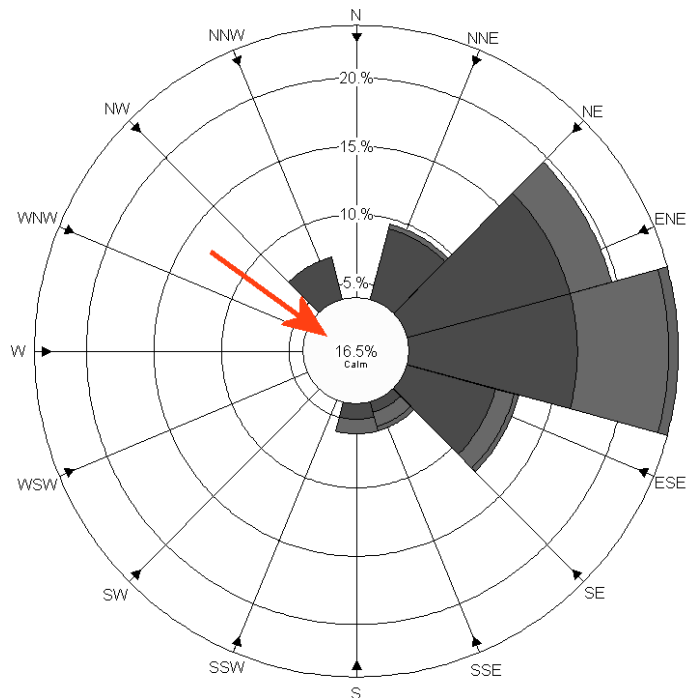


Figure 13

The *Diagram Options / Colors* tab (Figure 14) is where the wind speed thresholds and colors for the rose petals are defined. The default configuration is based on the Beaufort Classification System. Please note that the units, be they miles per hour or kilometers per hour are inconsequential provided that your usage is consistent.

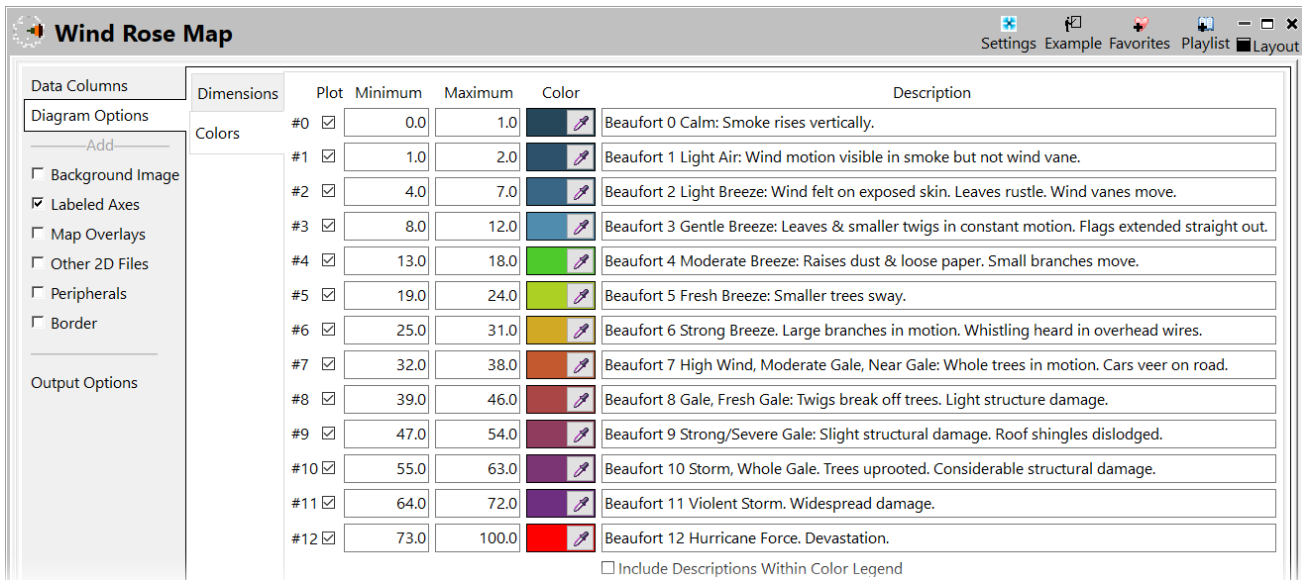


Figure 14

To add a color legend to the output, check the *Peripherals* box within the *Wind Rose Map* menu (Figure 14), enable the *Symbols* option and adjust the position, size, and title for the *Symbols* legend.

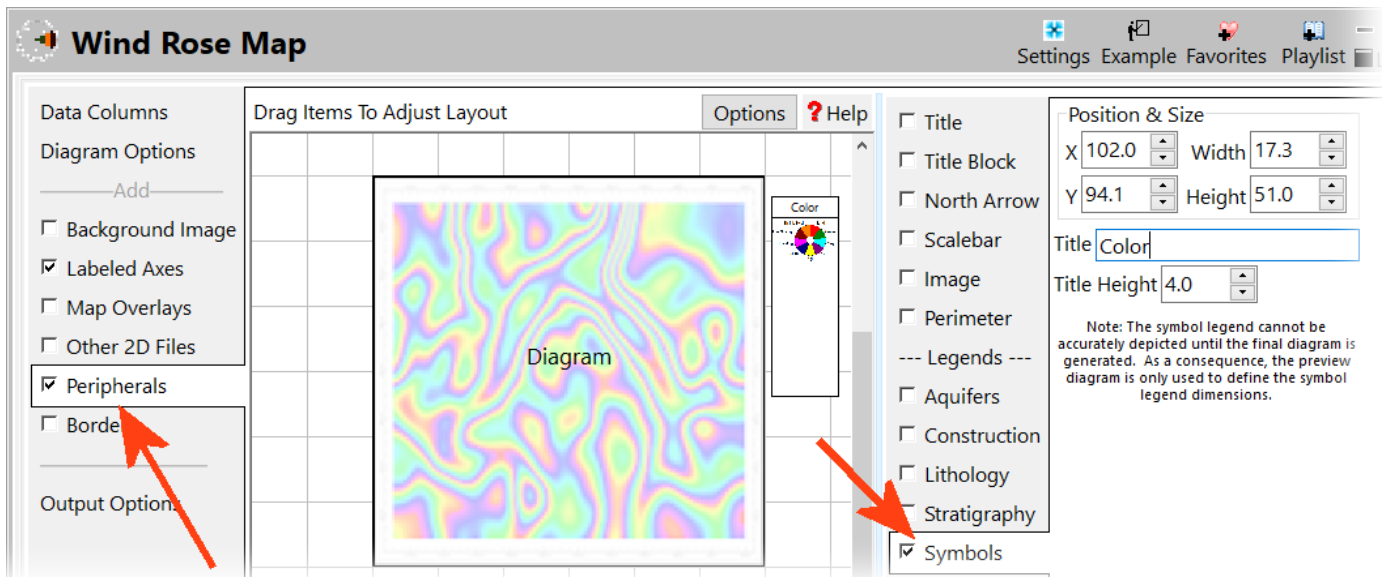


Figure 15

Getting the legend to look just-right (Figure 16) may take several iterations.

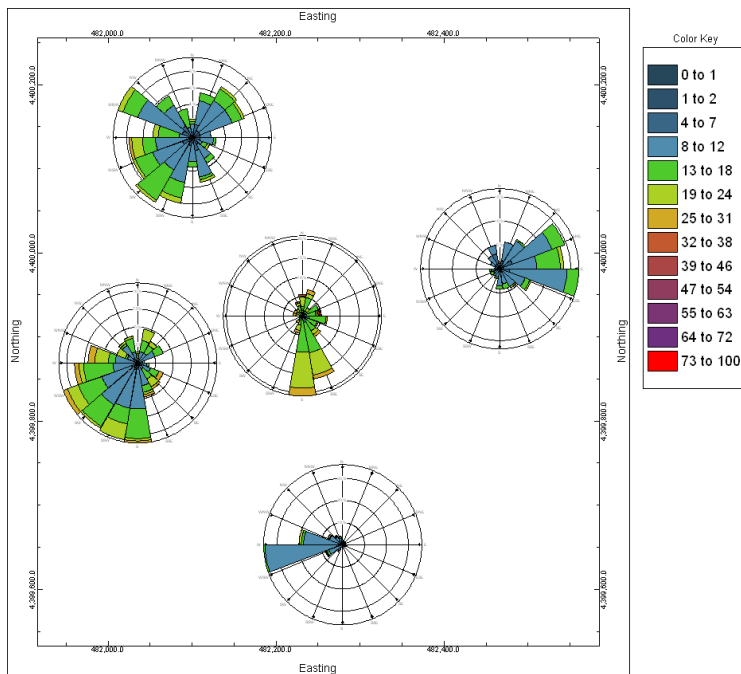


Figure 16

Consequently, you may want to consider saving your legend *Layout* (Figure 17) once you're satisfied with the results by selecting the *Peripherals / Options / Save* option. This will alleviate the trial-and-error process when generating subsequent diagrams.

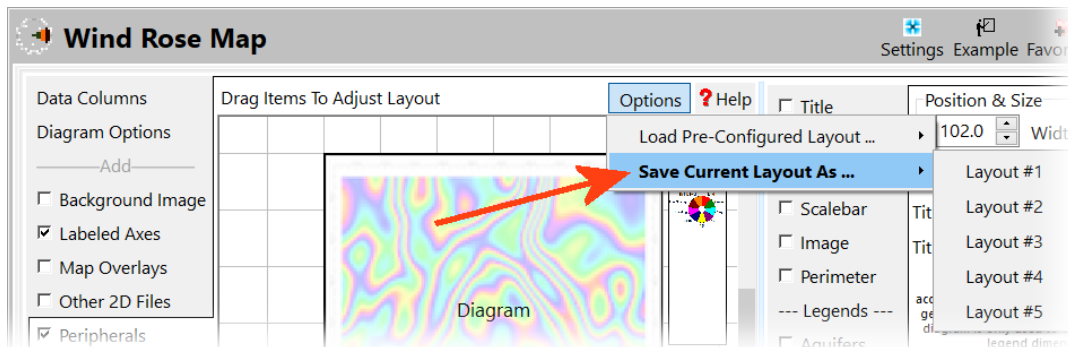


Figure 17

If desired, the comments within the *Color* table (Figure 18) may be included within the legend by checking the checkbox at the base of the menu labeled “*Include Descriptions Within Color Legend*” to produce a more descriptive legend (Figure 19).

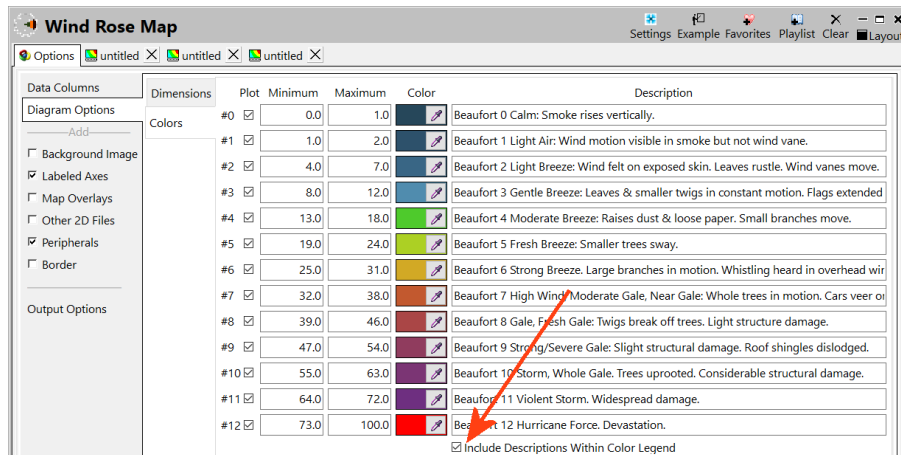


Figure 18

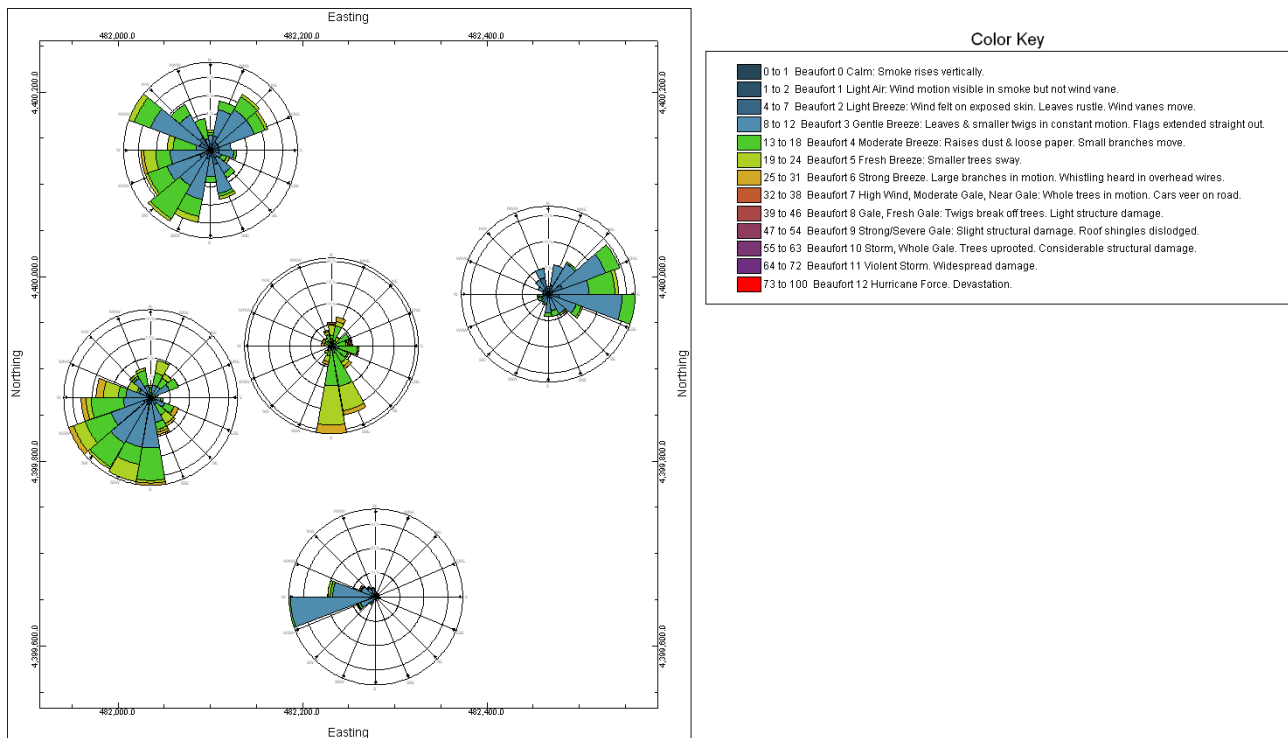


Figure 19

As with other RockWorks maps, the *Wind Rose* output may be combined/overlay with other maps and exported to Google Earth (Figure 20).

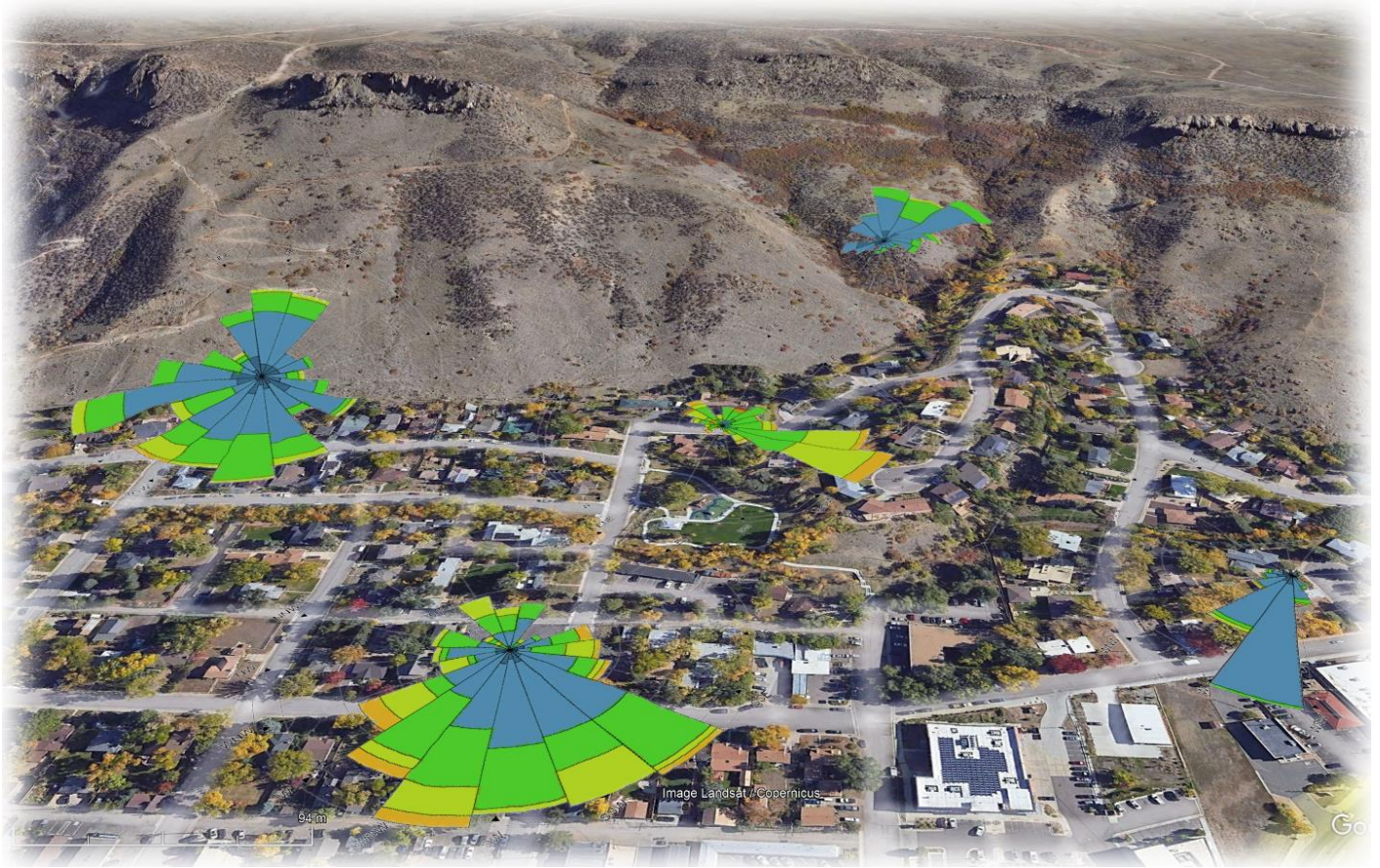


Figure 20