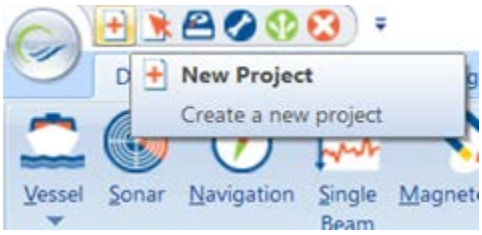
Quick Start Guide to Magnetometer Data Processing

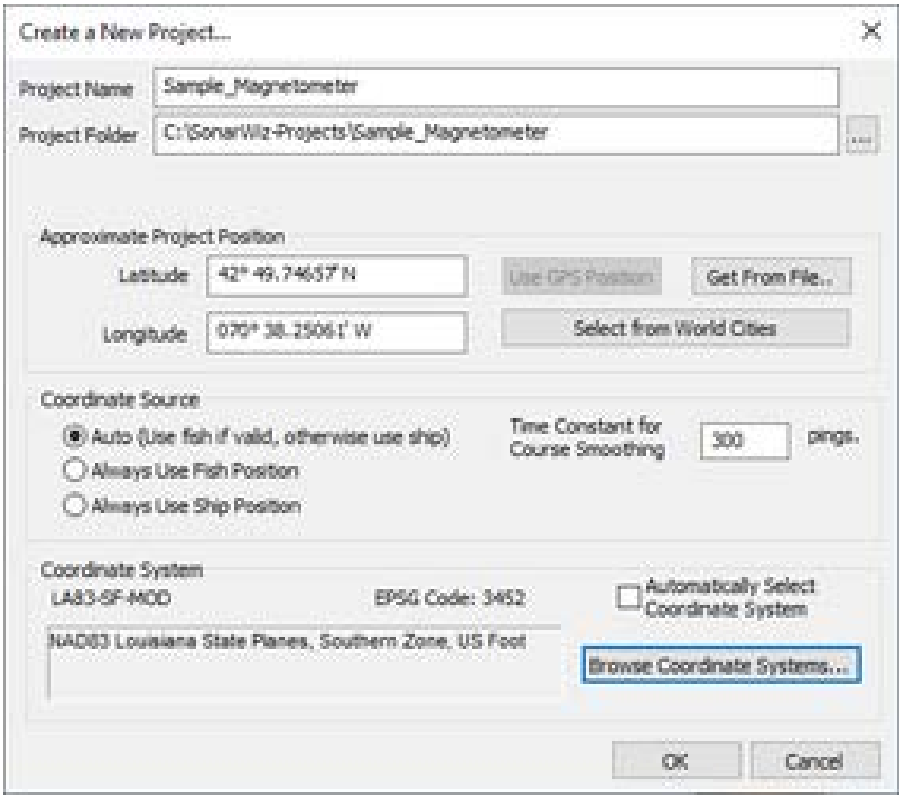
This Quick Guide will show you step-by-step how to process magnetometer data in SonarWiz.

Instructions:

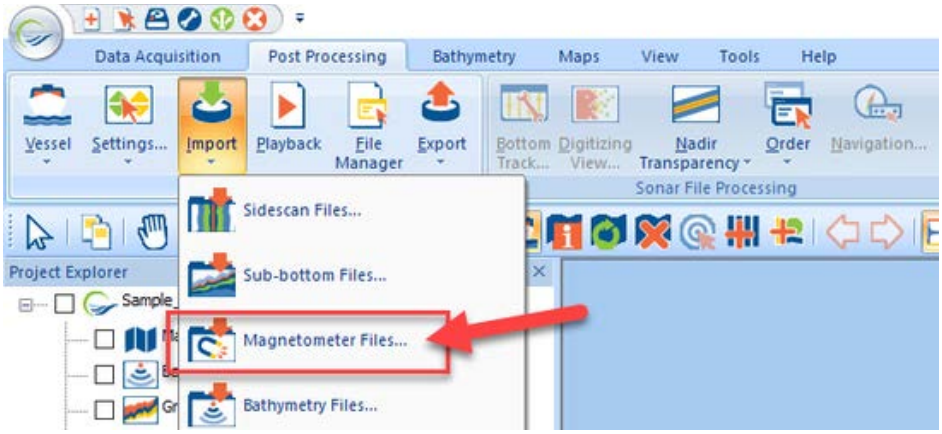
1. Select the **Create a New Project** option in the Quick Access Toolbar.



2. Enter a **Project Name** and then set the position of the data. Most magnetometer files are stored as a .CSV text file and the “Get From File” option will not be able to pull a valid position. In this case, you will need to either know the Approximate Latitude and Longitude of the project or select the **project coordinate system** manually.



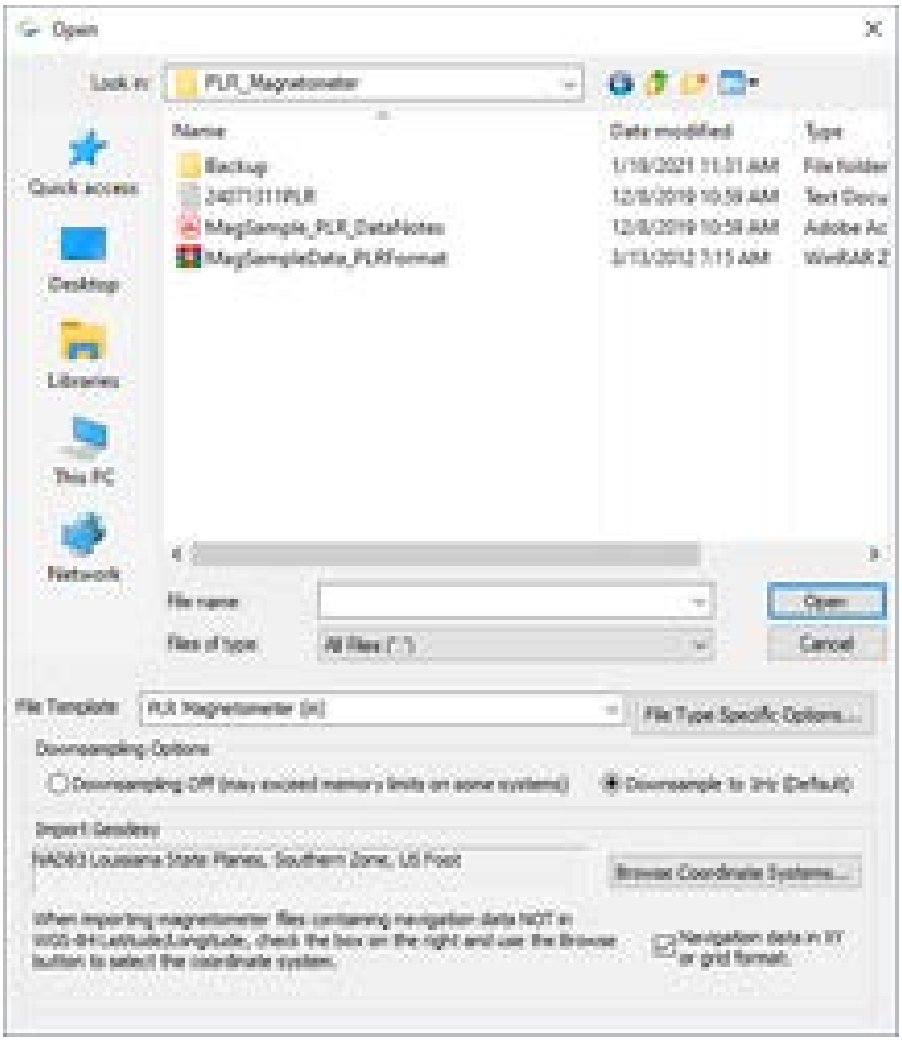
3. Once the project is created, navigate to the **Post Processing** tab and use the **Import** drop down menu to select **Magnetometer Files…**



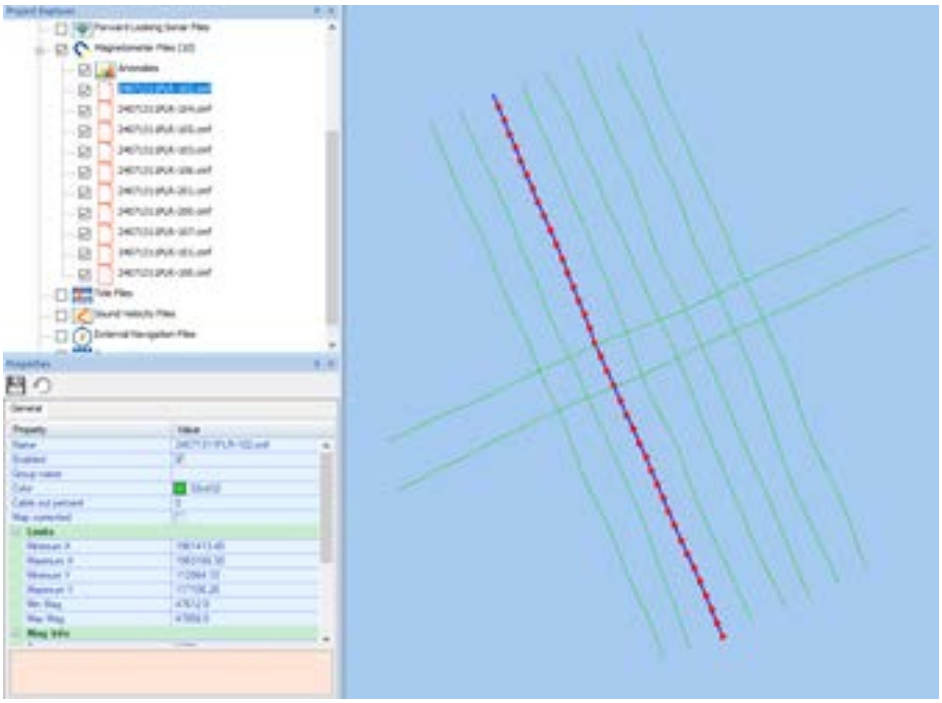
Unlike sonar data that has a recognizable file format that SonarWiz can import, you will need to select the correct **file template** for your magnetometer files and your data must conform exactly to the fields in the template. For a complete list of the supported formats, see the Supported Magnetometer File Formats page.

By default, SonarWiz will **downsample** your magnetometer data to 1Hz (for example 10,000 raw records at 10Hz will result in 1,000 imported samples). This option can be turned off in the Downsampling Options section.

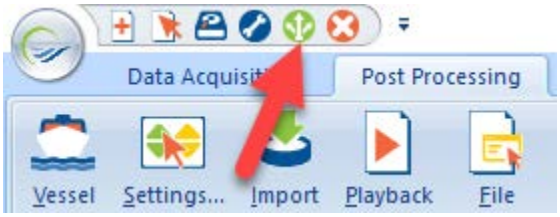
If your magnetometer data was recorded in projected easting and northing, you will need to specify the coordinate system used in the **Import Geodesy** section in order for SonarWiz to reproject into the project coordinate system.



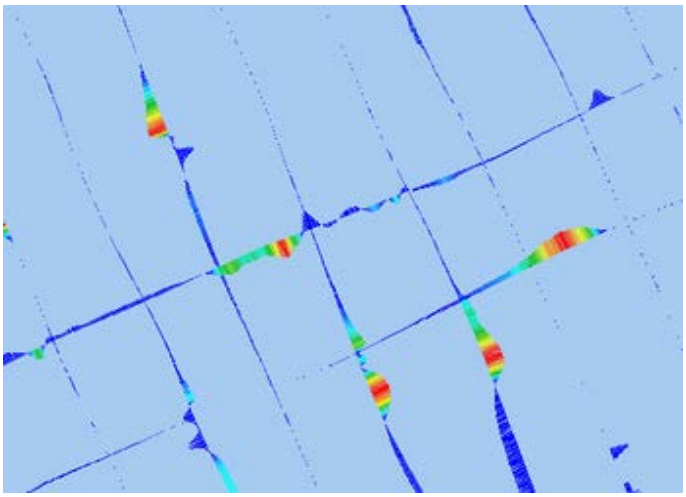
4. Once the data is imported into the project, you will see files added to the Project Explorer as well as navigation track lines in the main display.



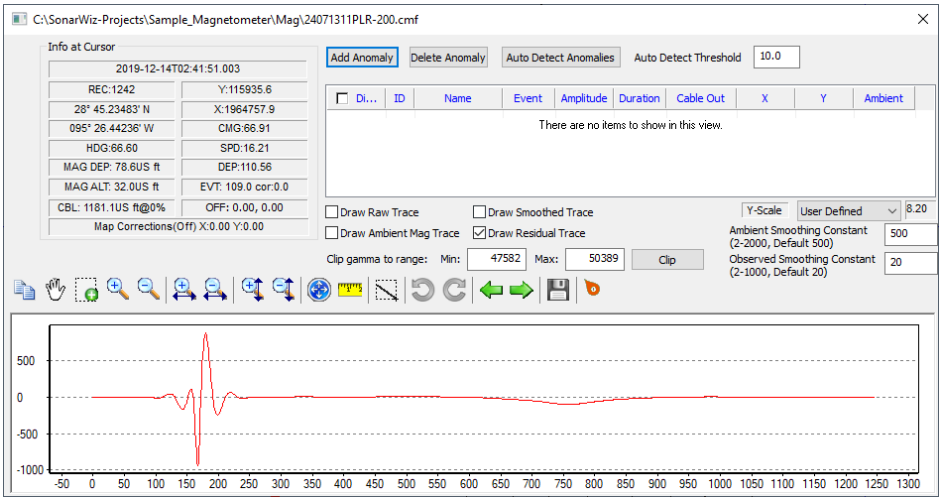
You can adjust the main display magnetometer file drawing options in the **Preferences and Settings** window located in the Quick Access Toolbar in the top-left of the program.



In the **Magnetometer Options** section, you will see options including labels, event numbers, drawing anomalies, as well as toggling between the imported lines displaying as **Navigation Track Lines** or **Color Coded Amplitude Segments** with options to change the color palette displayed.



5. To view the imported magnetometer data in each line, right click the file in the Project Explorer and select **Edit Selected Mag File…** (or hotkey select and ENTER)



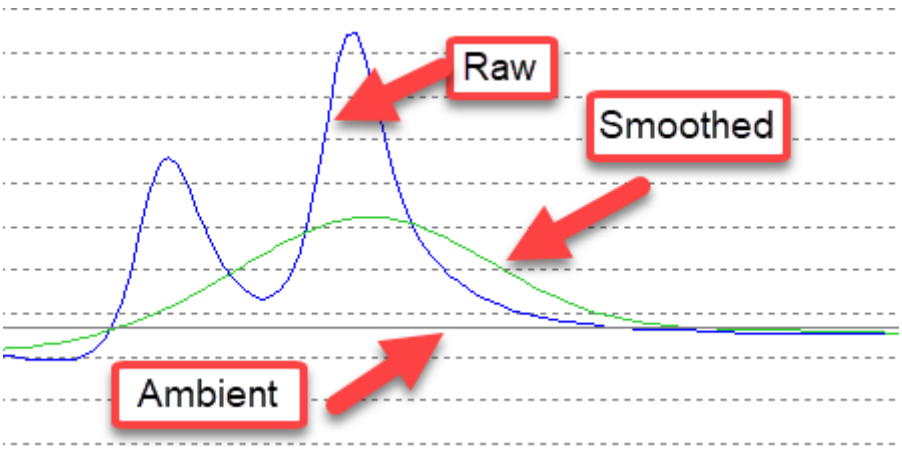
The magnetometer file editor displays the data in a **graph view** with cursor tracked data values in the **Info at Cursor** and the records displayed on the X axis and the gamma on the Y axis.

The **Graph Toolbar** has options to zoom in/ out of the graph, measure, move from file to file, and add map correction points. For more information, see the Map Corrections for Magnetometer page.

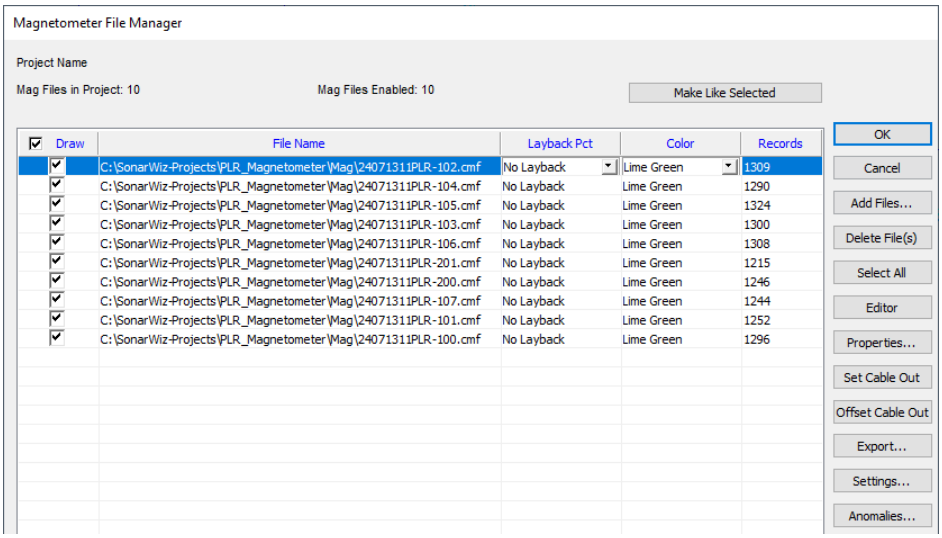
There are 4 **trace drawing options** in the graph view:

- **Raw Trace** which displays the raw magnetometer data from the file.
- **Smoothed Trace** which will smooth the raw data based on the Ambient Smoothing Constant.
- **Ambient Trace** which will attempt to find the ambient background magnetometer signal based on the Observed Smoothing Constant.

These 3 drawing options can be used together in the Graph View together. The remaining drawing method, the **Residual Trace**, is calculated by subtracting the Smoothed Trace from the Ambient Trace. This option can only be displayed by itself in the graph view.



6. Many of the options for Magnetometer files can be accessed in the **Magnetometer File Manager**. To access the file manager, right-click Magnetometer Files in the Project Explorer and select **File Manager…**



The **Make Like Selected** option works similarly to the Make Others Like This option for sonar files and is used to copy adjusted settings from the selected magnetometer file to others in the project.

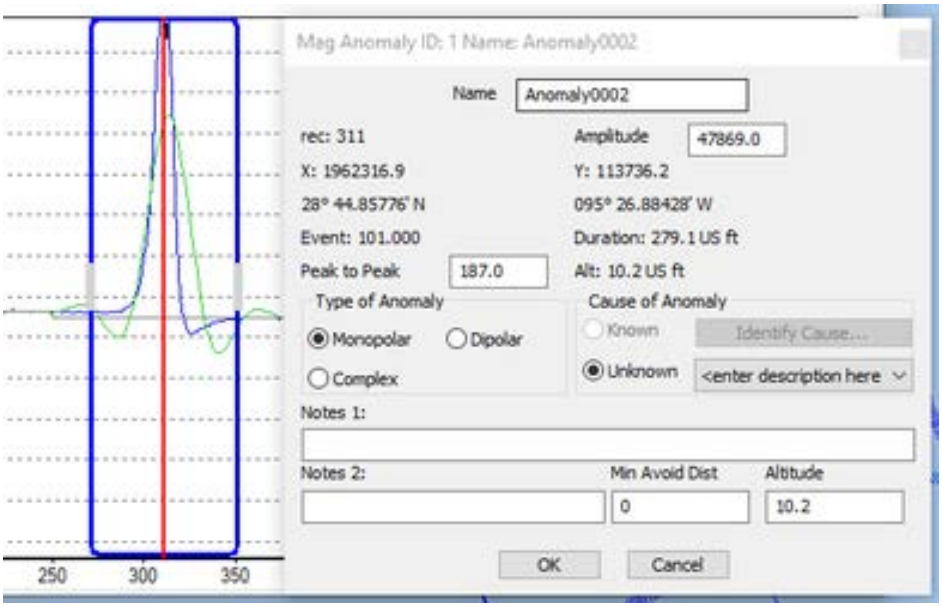
Currently only a horse and cart static offset is available as a layback option for magnetometer files and can be done by adding or offsetting the **Cable Out** value. The Info at Cursor in the File Editor will show the current Cable Out value added in each record. To adjust the layback for each magnetometer file, use the **Layback Pct** drop down menu (to apply all of the Cable Out value, select 100 pct).

The **Export** option in the Magnetometer File Manager is used to export the raw magnetometer data to a CSV file which can be gridded or brought into another program.

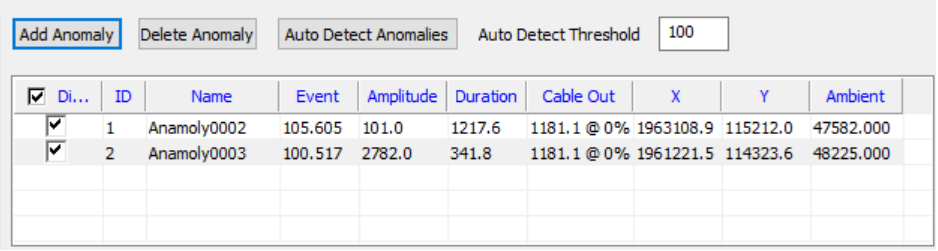
```
X,Y,Gamma
1963166.30,112964.10,47694.00
1963165.00,112967.30,47694.00
1963163.70,112970.60,47694.00
1963162.40,112973.80,47694.00
1963161.10,112977.00,47694.00
1963159.70,112980.20,47694.00
1963158.40,112983.40,47694.00
1963157.00,112986.50,47694.00
1963155.60,112989.70,47695.00
1963154.20,112992.80,47695.00
1963152.80,112996.00,47695.00
```

7. **Anomalies** (contacts for magnetometer files) can be captured on the imported files by either manually selecting them in the graph view using the **Add Anomaly** command or having SonarWiz automatically detect them using the **Auto Detect Anomalies** command.

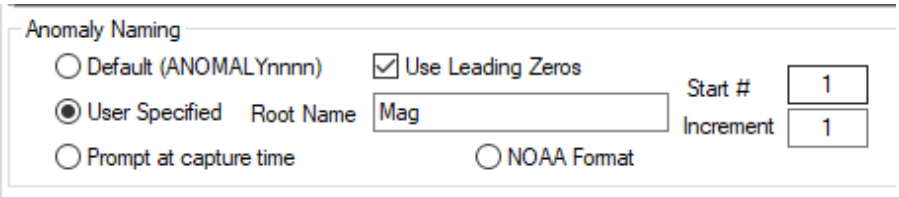
To manually select an anomaly location, hit Add Anomaly and select the area in the graph view you would like to capture. Once the anomaly is created, the **Anomaly Editor window** will appear which will display the info a cursor as well as fields for adding text. If you have added a polygon SHP file to the project, the **Cause of Anomaly** section will allow you to select one of the attributes as a Known Cause.



The Auto Detect Anomalies command uses the **Auto Detect Threshold value = X** and scans the file for any samples where **Smoothed Trace - Residual Trace > X**. Each captured anomaly will appear in the Anomaly Management window and can be selected, edited, or deleted.

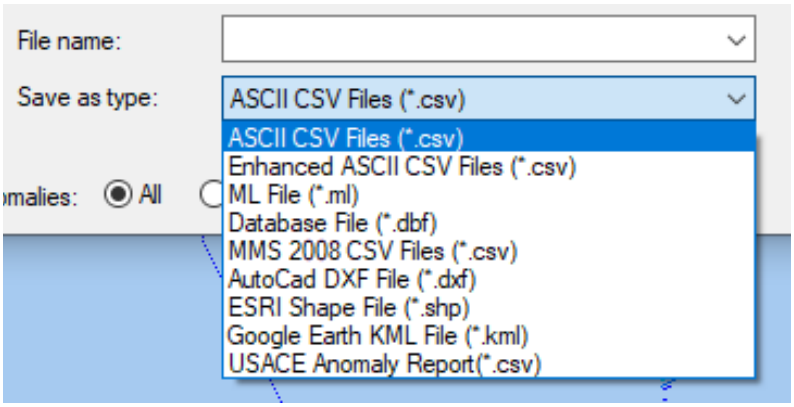


The user can either manually change the name of the captured anomalies upon creation or use one of the available naming schemes. To change the **naming scheme** for future captured anomalies, open the Preferences and Settings window, navigate to the Magnetometer Options section, and choose a **User Specified Root Name** and starting/ incrementing number in the **Anomaly Naming** section.



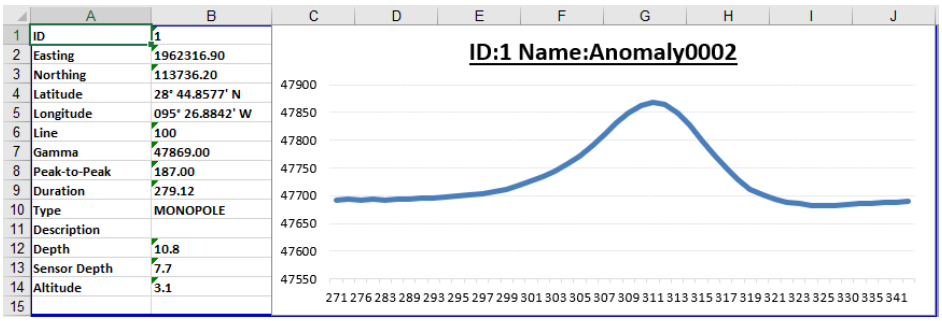
8. To export the captured anomalies and their data, the user can either create a .CSV or a report similar to the contact report.

To export a .CSV, right click the desired anomalies and select **Export Selected Anomalies**. This should open Windows Explorer where the user can select which output format is desired and if only certain types of anomalies are exported.



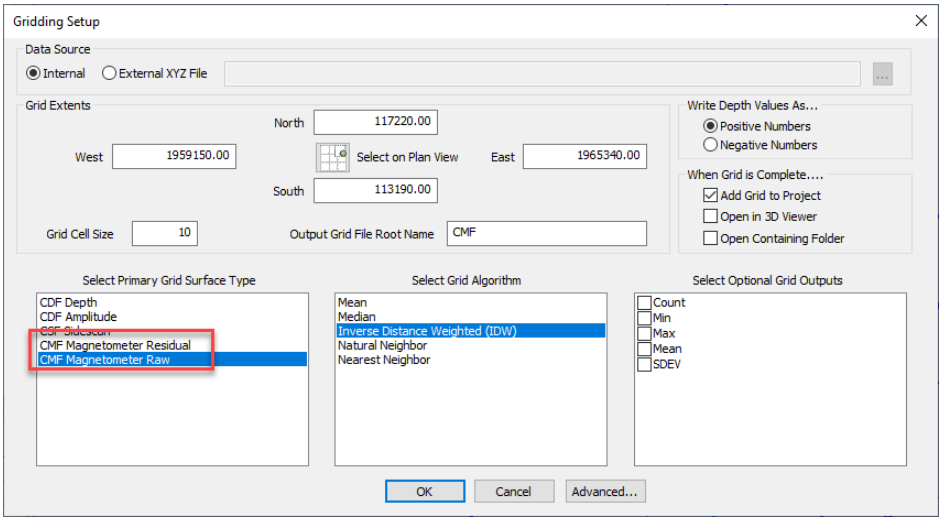
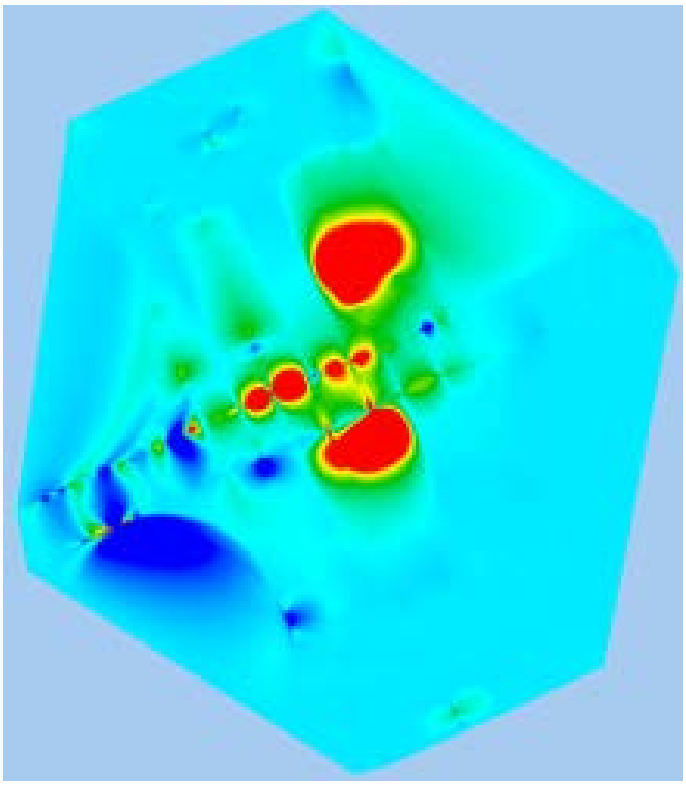
To create a Anomaly Report, right click the desired anomalies and select **Report Selected Anomalies**. Anomaly reports currently support 3 options:

- PDF
- MS Excel Table
- MS Excel Table w/ Mag Charts



	A	B
1	ID	1
2	Easting	1962316.90
3	Northing	113736.20
4	Latitude	28° 44.8577' N
5	Longitude	095° 26.8842' W
6	Line	100
7	Gamma	47869.00
8	Peak-to-Peak	187.00
9	Duration	279.12
10	Type	MONOPOLE
11	Description	
12	Depth	10.8
13	Sensor Depth	7.7
14	Altitude	3.1
15		

9. To **Grid** the magnetometer data in the project, right click Grids in the Project Explorer and select **Create New Grid…**



In the gridder, choose either CMF Magnetometer Residual or CMF Magnetometer Raw for the **Grid Surface Type** and choose the desired **Grid Algorithm** (note: if you require interpolation between track lines you will need to choose either IDW, Natural Neighbor, or Nearest Neighbor). Finally, select a Grid Cell Size and Output Name and hit OK.