

Importing Kongsberg Backscatter as Sidescan
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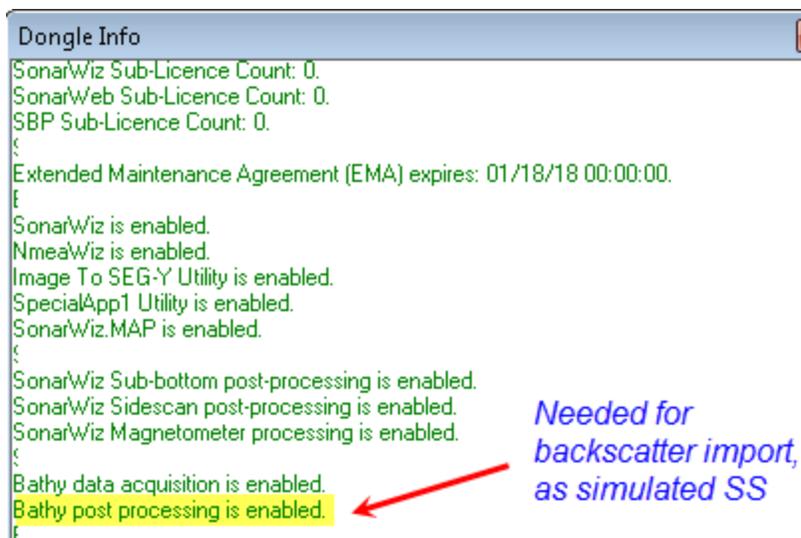
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1 Importing Kongsberg Backscatter into SonarWiz

This technical note describes the recommended technique for importing Kongsberg ALL files containing backscatter data, as sidescan, into a SonarWiz project. Start by setting up your project with CREATE PROJECT or NEW and setting up the project location (latitude, longitude) and choose the coordinate system, then define your VESSEL using the vessel editor.

1.1 Bathymetry Licensing Required for Sidescan Import

The Kongsberg ALL backscatter data import as sidescan, requires a bathymetry post-processing license, and you can see that you have one by using TOOLS -> DongleInfo in your SonarWiz GUI, like this. Either a permanent or temporary (evaluation) bathymetry post-processing license will support the backscatter data import as sidescan from a Kongsberg ALL file.



The topic of this reference is the special new ability in 6.05.0014, to import from the same Kongsberg ALL file, using the backscatter packets, but splitting them into starboard and port sides of a display, as if they were sidescan.

1.2 Background - Adding a Feature Revision - Planned in SonarWiz 6.05.0014

Here is some discussion which led to this new import feature for SonarWiz 6.05.0014.

We used to process Kongsberg time series data like sidescan images. Basically, we imported the imagery as if it were a sidescan with no bathymetry information at all. This was fast, and the imagery looked good (for multibeam data), but we lost the accurate positioning information. In flat areas, this wasn't a big deal, but when the boat was turning or when the imagery was over a wreck or rough terrain, the image pixels were not accurately positioned (just like sidescan).

In more recent versions of SonarWiz (2010-2017), we required that the user process the bathymetry (using a bathymetry post-processing license) so we would know where those image pixels belong. This was accurate, regardless of the topography and the imagery looks good, but it is slow for the user because it requires you to fully process the bathymetry before you can see the backscatter images.

It occurs to us that with Kongsberg files, there may be a middle-ground. If you configured SIS to write XYZ88 packets in addition to the time series backscatter; the bathymetry may already be computed in the files. We might be able to geo-reference the imagery on import, using the XYZ88 bathymetry, and create a pseudo-sidescan image with better geo-referencing than you would normally get from traditional sidescan.

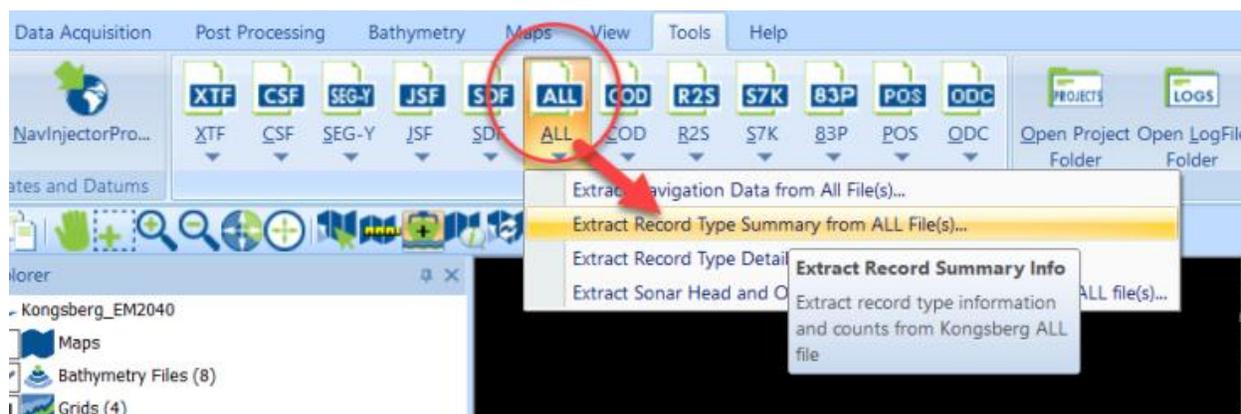
We decided to proceed on adding an import option to try this out to see if we could improve the processing speed of imagery (backscatter) alone, from Kongsberg ALL files.

1.3 Eligibility for This Import - See if you have XYZ88 Packets

The import plan was to use a particular imagery packet from the Kongsberg ALL sonar data, called an XYZ88 packet. You can preview your Kongsberg ALL file using

TOOLS -> ALL-> Extract Record Type Summary from ALL File(s)

selected from the SonarWiz post-processing GUI like this:



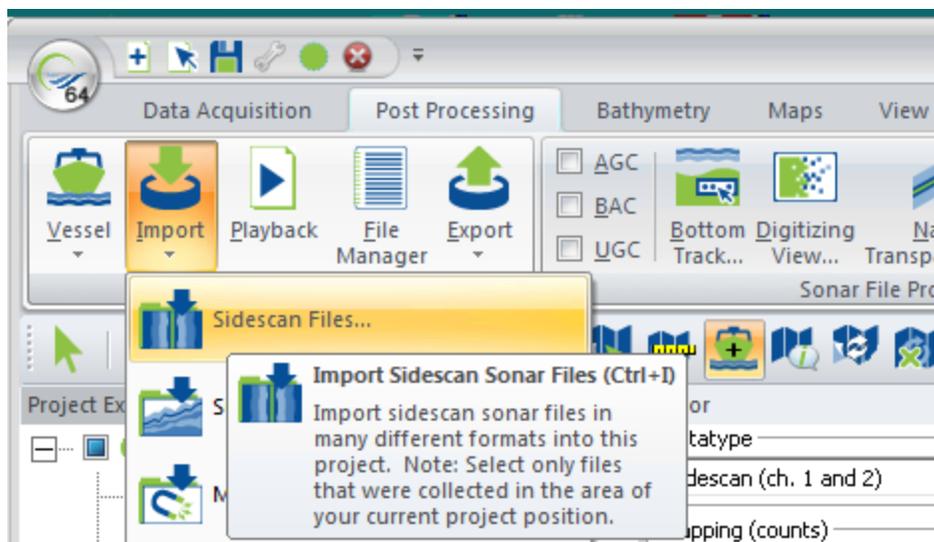
This will produce a CSV text file in the MISC folder of your project, with a list of the packets contained in the file. You can open the CSV file in Excel or Notepad. Check for the line highlighted here:

	A	B	C	D	E
1	Model	Record ID (hex)	Record ID (dec)	Description	Count
2	???	31	49	PU Status output	80
3	???	41	65	Attitude datagram	71
4	???	43	67	Clock datagrams	79
5	???	47	71	Surface sound speed	23
6	???	49	73	Installation parameters	1
7	???	4E	78	Raw range and angle 78	1134
8	???	50	80	Position	76
9	???	52	82	Runtime parameters	1
10	???	55	85	Sound speed profile dat	1
11	???	58	88	XYZ 88	1133
12	???	59	89	Seabed image data 89	1133
13	???	69	105	Installation parameters	1
14	???	6E	110	Network attitude velocity	788

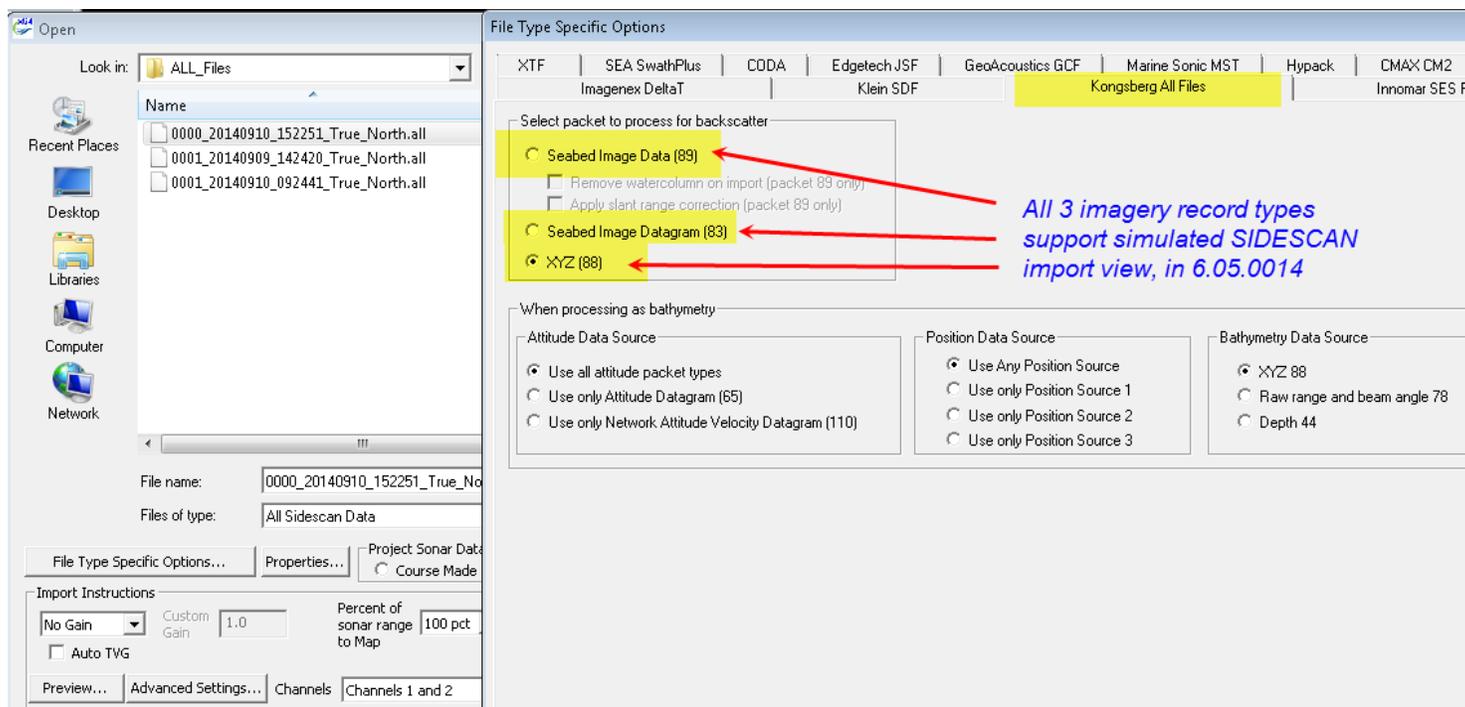
The packet type (record ID) is 58 hex, 88 decimal, and when present, contains backscatter imagery which SonarWiz can import as sidescan data. This example file does contain some backscatter data in both 88 and 89 type packets.

1.4 Importing Kongsberg ALL as SIDESCAN data

The main new feature in SonarWiz 6.05.0014 is the use of a bathymetry post-processing license to import XYZ88 packets (backscatter data), in a way simulating sidescan view of MBES data. So you start with Post-processing -> Import -> Sidescan like this:



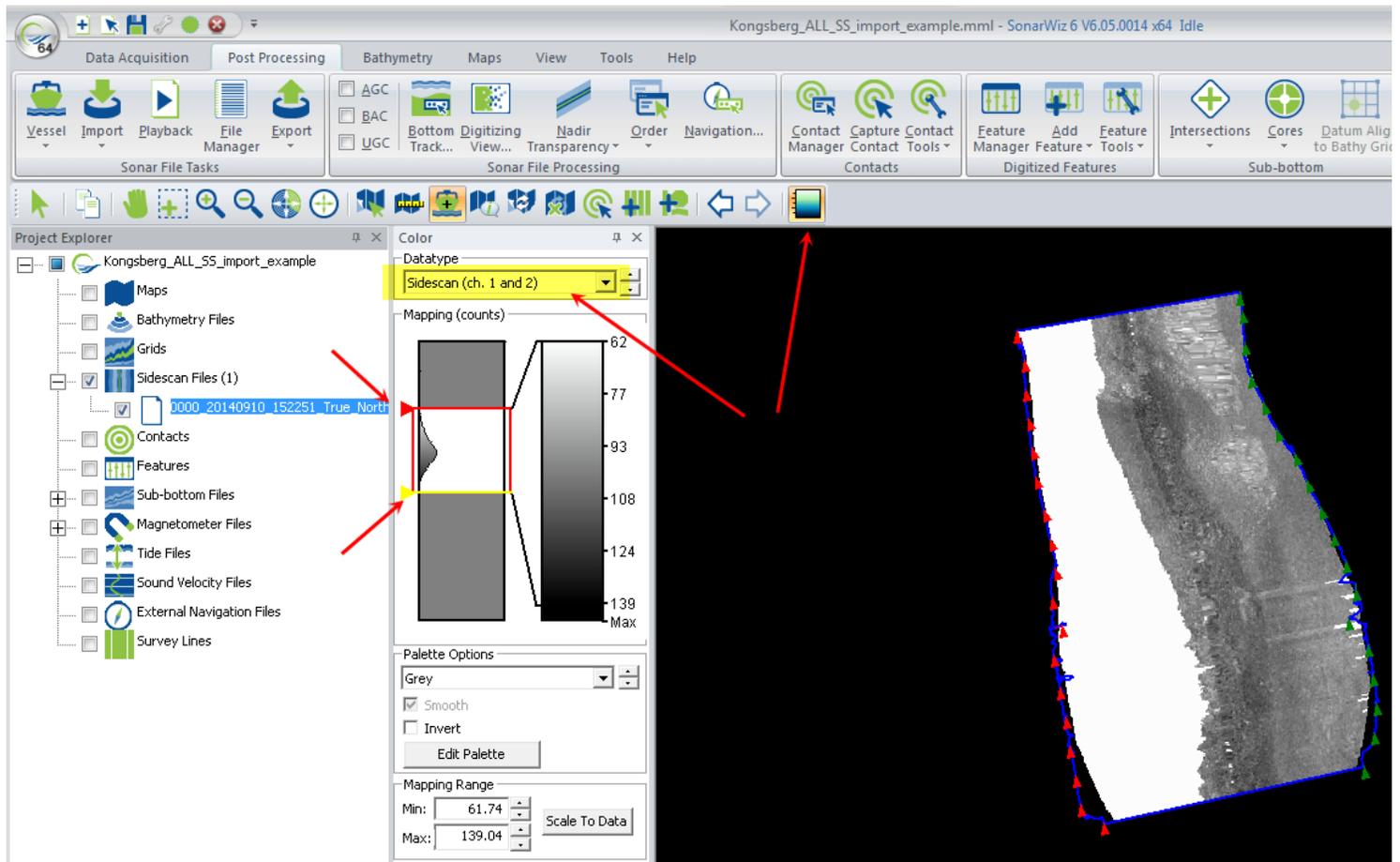
Then in the IMPORT -> OPEN dialog, you need to choose FileTypeSpecificOptions and select the packet types to import from the Kongsberg ALL file, like this:



The XYZ88 packet types are best at this point in time, though decimal record IDs 83 (seabed image datagram) and 89 (seabed image data) can be tried as well, for comparison, if you have those in your ALL file.

1.5 Sidescan View of Kongsberg ALL XYZ88 records import

Here is a shoreline view in simulated sidescan, created by importing the Kongsberg ALL file backscatter data from the 2015 Shallow Water Survey common data set. Basically it is a multi-beam Kongsberg dual-head EM2040 sonar, recording interferometry and backscatter, but now you can view the backscatter data as if it were sidescan.

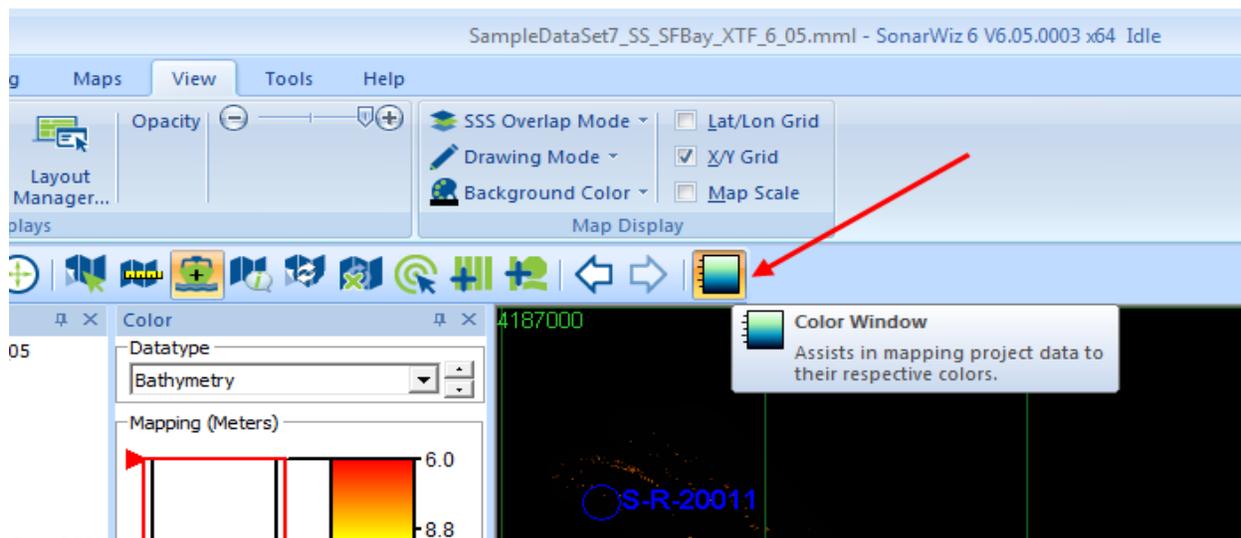


You may want to try packet types 83 and 89 if you have them, or compare, if you have a bathymetry license, to the backscatter (bathymetry import) views of the same data.

Overall this new features allows a slightly faster access to import and imagery review of backscatter data, by presenting it as simulated sidescan data. It works best with single-headed sensors at this time, but dual-headed sensor support will be improved in the near term.

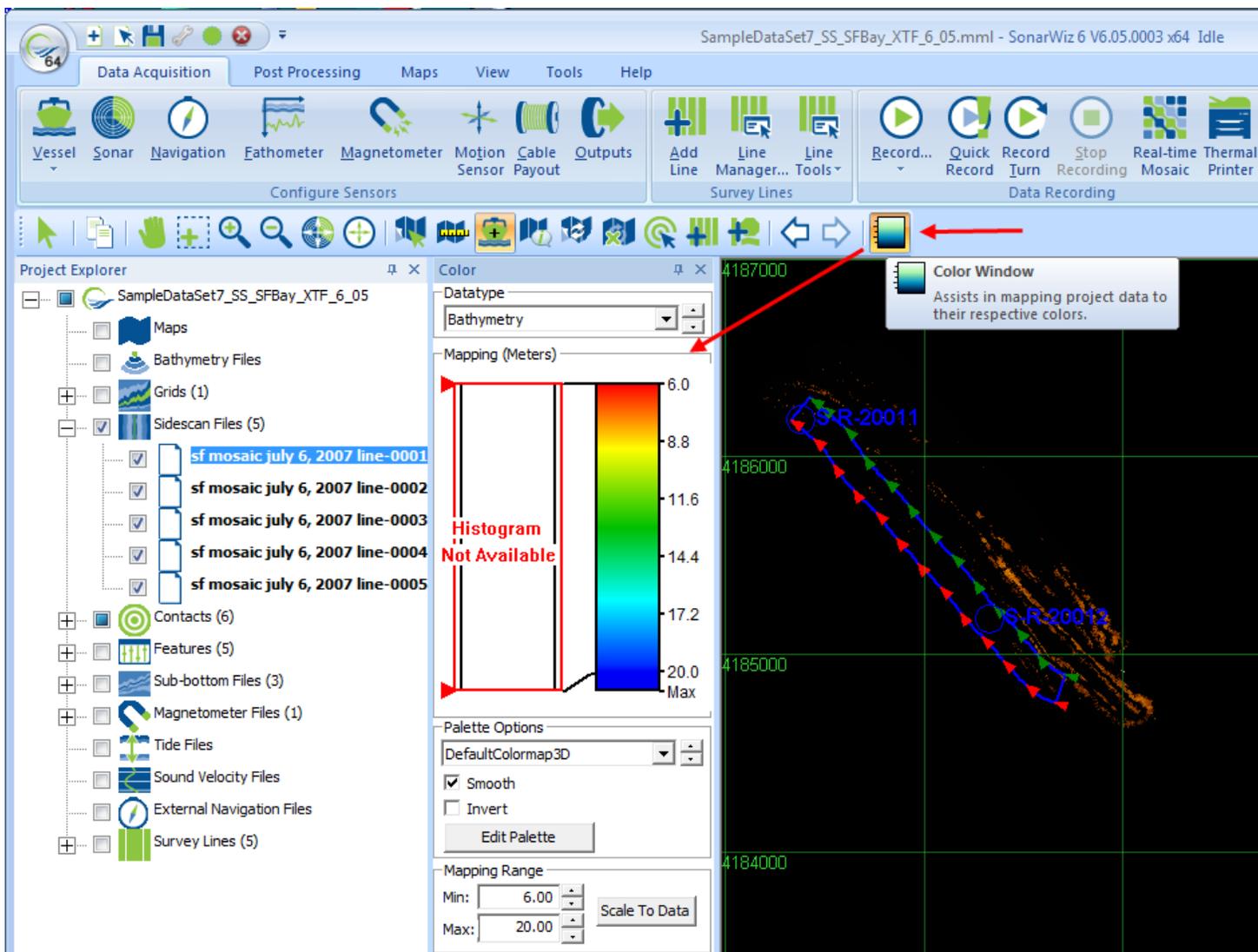
2 SonarWiz 6.05 Versions - COLOR WINDOW and HISTOGRAM use

In the example above, we selected to dock a COLOR WINDOW left of the map view. This section explains how to use the 6.05-series SonarWiz versions to modify sidescan, or bathymetry data display, using the new COLOR WINDOW tool available in the map menu bar.



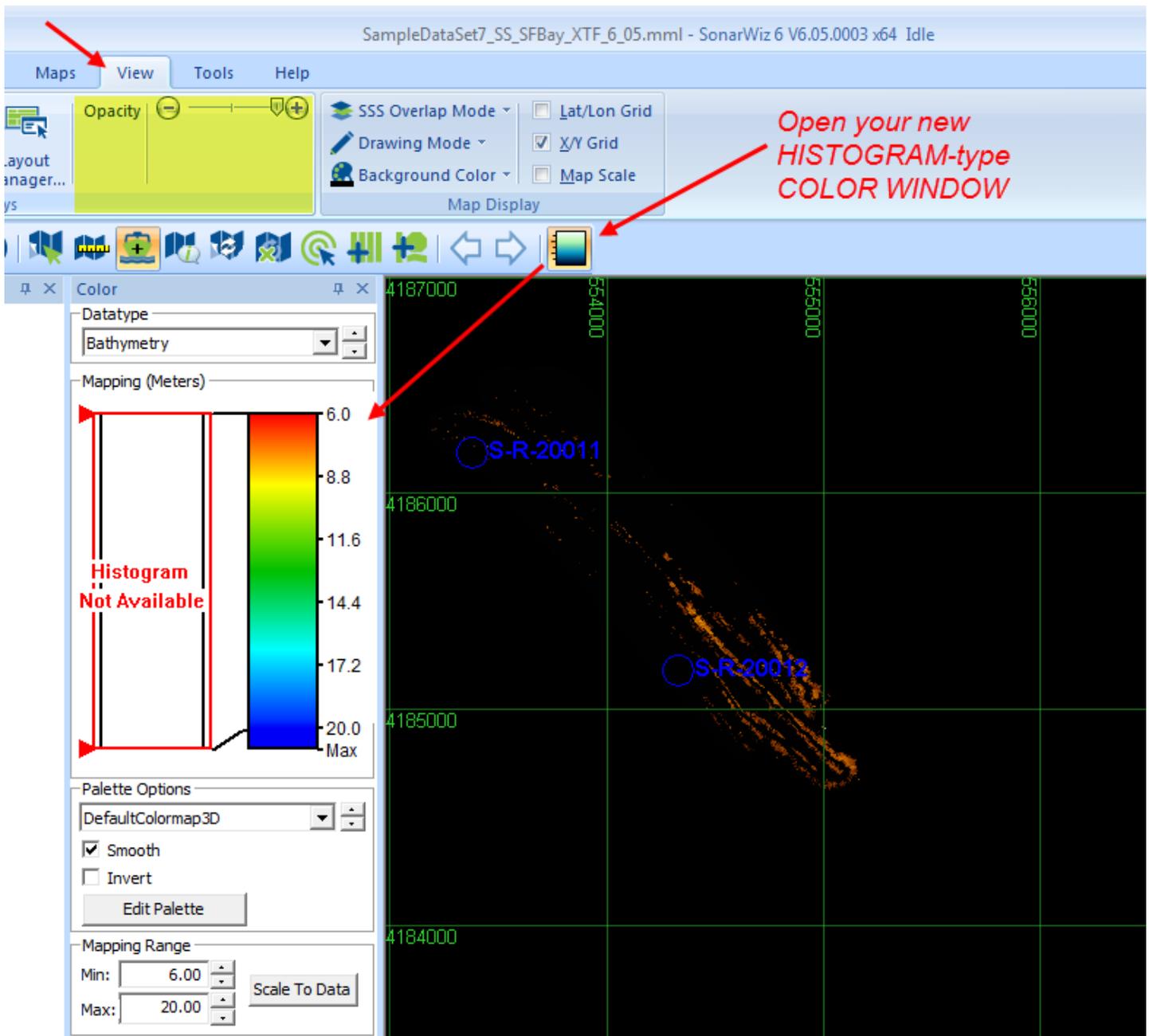
2.1 SonarWiz earlier versions - COLOR WINDOW - Gradient-Legend Type

SonarWiz 6.04 series, and earlier versions of SonarWiz, had display color, hue, brightness, and palette compression available at the top level of the SonarWiz GUI, like this:

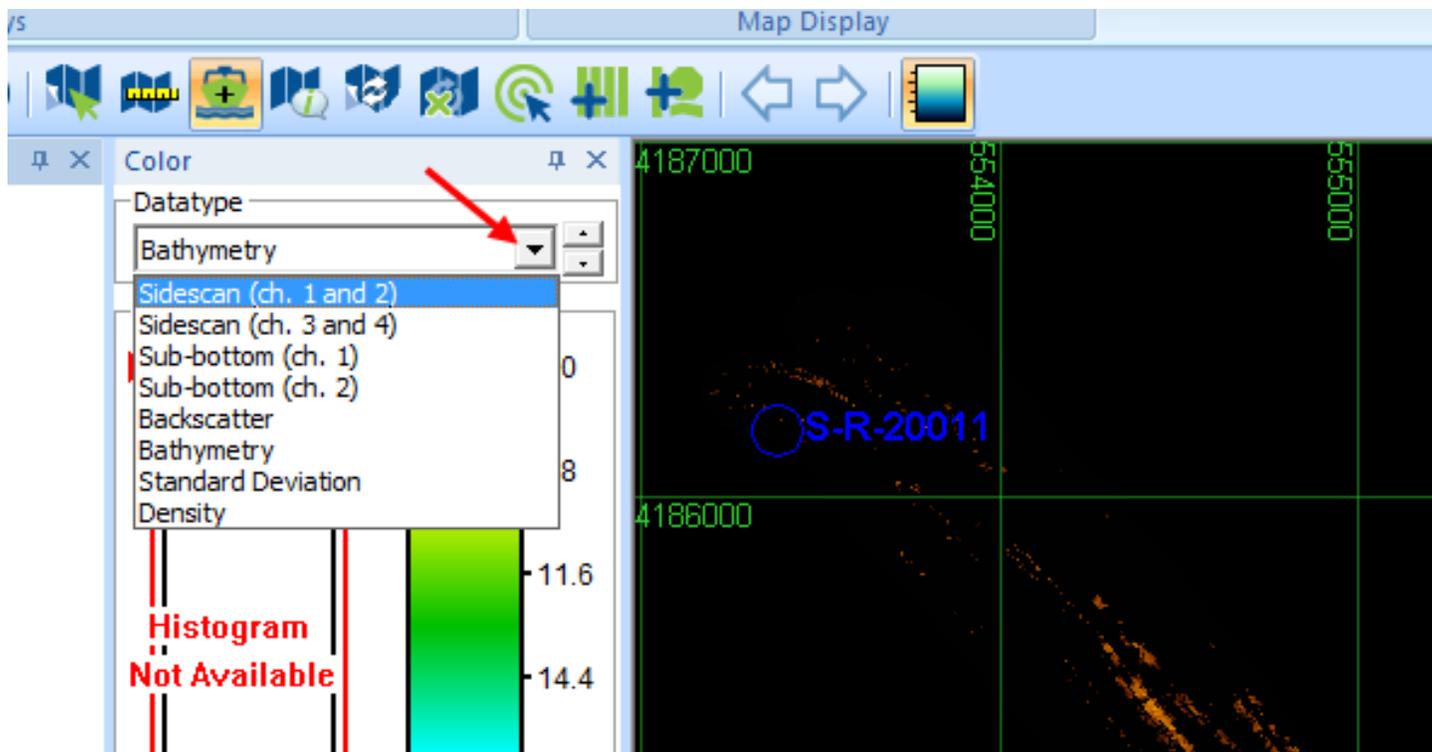


2.1 SonarWiz 6.05.0001++ - new HISTOGRAM type COLOR WINDOW

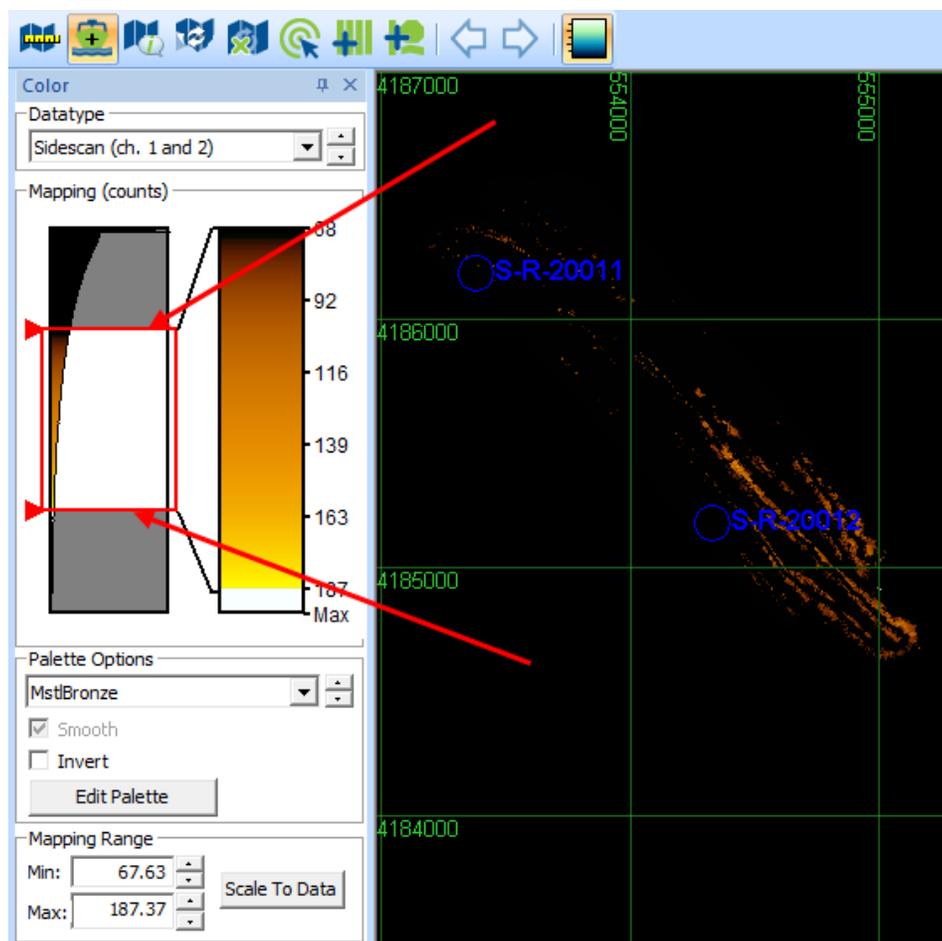
In SonarWiz 6.05.0001 and later versions, the VIEW options for color control are gone from the GUI top, because the COLOR WINDOW (gradient legend) has radically changed for the better - with a HISTOGRAM control:



If you see NO HISTOGRAM AVAILABLE, chances are (like this demo GUI), the Datatype selected in the COLOR WINDOW just does not match the data displayed in your map view. (Our says BATHYMETRY, but In this case it is a SIDESCAN project). So the first thing to do here is change the DATATYPE to Sidescan channels 1-2.:

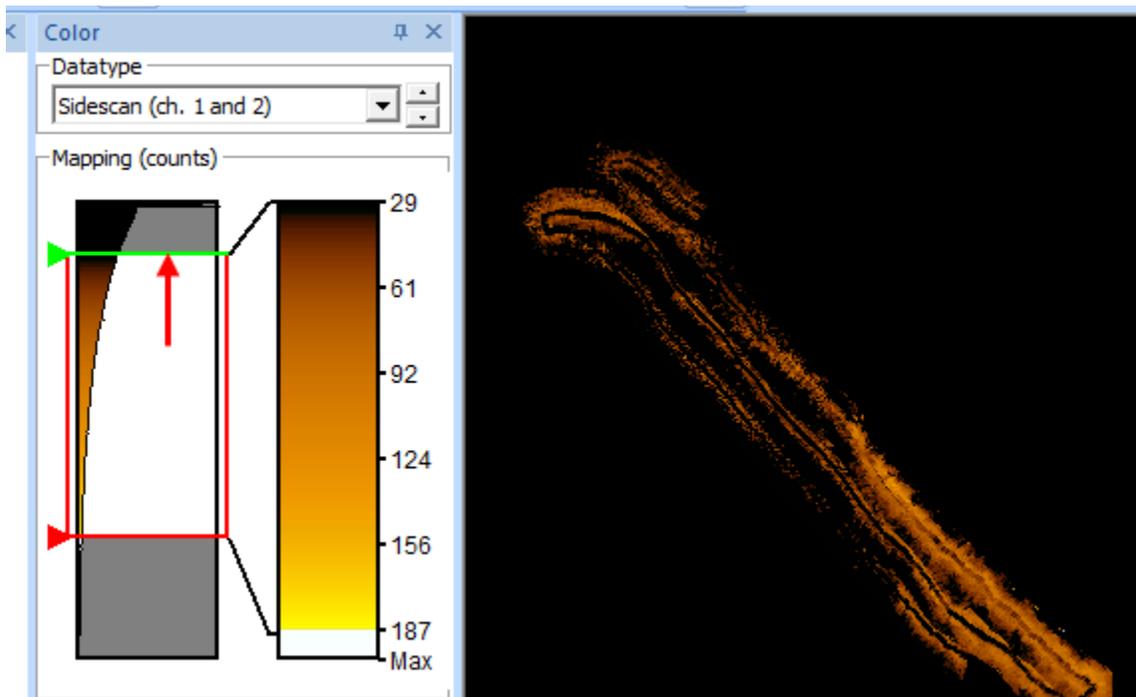


This will result in a histogram-presentation representing a frequency-histogram display of the data values in your sidescan data:

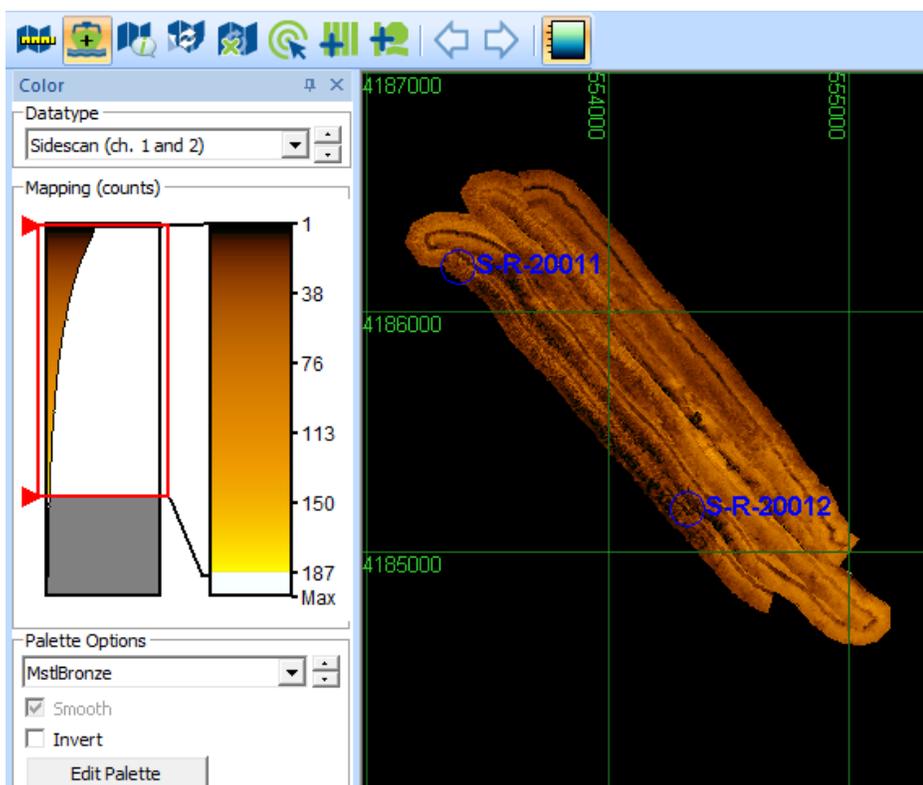


Now you can change the way color maps to data values, by left-clicking and dragging the upper and lower limit bars in the histogram. Ours currently eliminates a majority (upper portion) of the data values, so we will move the upper limit UP to see a better view of the data:

Hover over the LIMIT BAR and it turns YELLOW, MOVE it and it turns GREEN:



Releasing the left-click when the limit bar is where you want it makes it turn RED again and the data will be adjusted:



2.1 Tutorial Video - HISTOGRAM-type COLOR WINDOW Explained

To see a recent Did You Know? type tutorial video explaining the COLOR WINDOW, and a few other recent sidescan enhancements in SonarWiz, here are a few viewing options:

DYK SS Mosaic - New Options - 6.05.0001 - tutorial video (4 min 50 secs)

(1) color window - histogram control design (time 0:00 - 1:14)

(2) nadir replacement filter demonstration (time 1:15 - 2:57)

(3) Grids -> Create Grid -> CSF Sidescan - new gridding option (time 2:58 - 4:50)

<https://www.youtube.com/watch?v=AHt4pftReHI&feature=youtu.be>

or ...

MP4 download link:

<https://sonarwiz.box.com/s/8lu07vv6ccg3hvhfdzt4zhnkxm0l479q>

The color-window tips there apply equally to sub-bottom data presentation.

3 Document History

Rev 1.0, 5/2/2017 - New document - special tips for Kongsberg 88-record inport as sidescan, new feature in SonarWiz 6.05.0014