OpendTect–加载地震数据

Li

1.2 设置Survey及加载数据

将学习如何设置一次新的Survey（一个项目），以及如何加载地震数据、层位和井数据（使用工业标准文件格式，如SEGY， LAS和ASCII）。

OpendTect可以与Petrel交互数据（商业部分：OpendTect Pro），还可以与SeisWorks和GeoFrame交互数据。

F3 Demo已经为OpendTect设置好了，就不用从头开始了，可以跳过本章，直接开始下一章的练习。

Raw Data位于名字为”Raw_Data”的文件夹。

1.2.2 SEG-Y扫描设置和加载

关于SEG-Y文件：

1.2.2a设置调查和加载SEG-Y文件

这里的加载SEG-Y文件，是为了建立一个新的调查，其中涉及扫描SEG-Y文件种的坐标信息等。

练习目的：设置一个新的OpendTect调查项目，使用SEGY扫描工具，从SEGY加载3D地震数据。

1.2.2a设置调查和加载SEG-Y文件

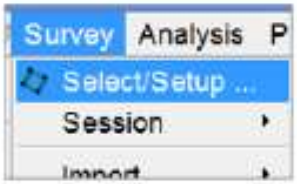
Workflow:

1. **Go to** Survey > Select/Setup…

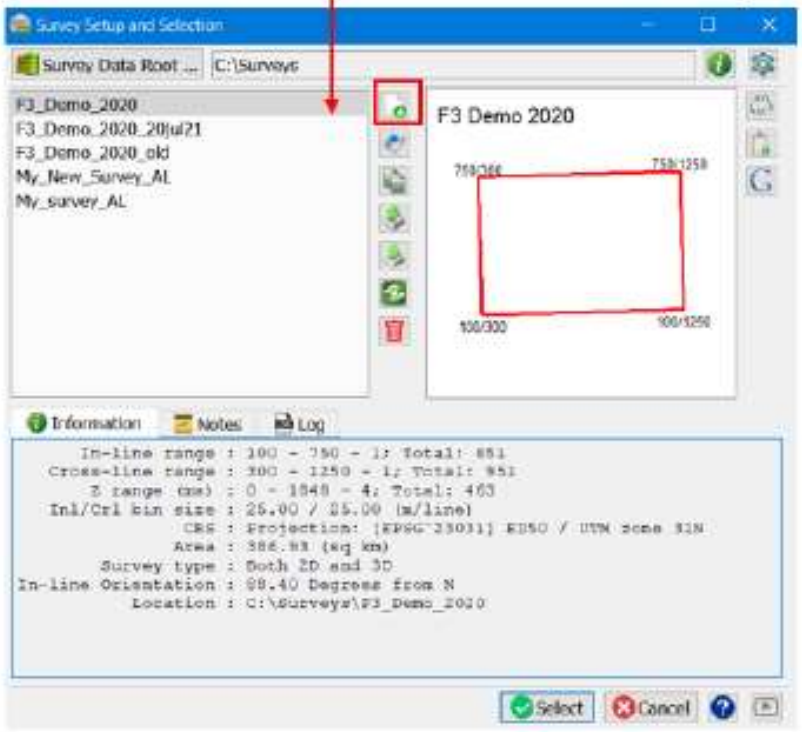
   or **click** on the Survey Setup icon .

2. **Click** on the New Survey icon .

When starting OpendTect for the first time, you arrive directly in the Survey Setup & Selection window.



List of all Surveys in this Survey Data Root directory.



第一次启动OpendTect时，提示直接下载F3等示例数据。

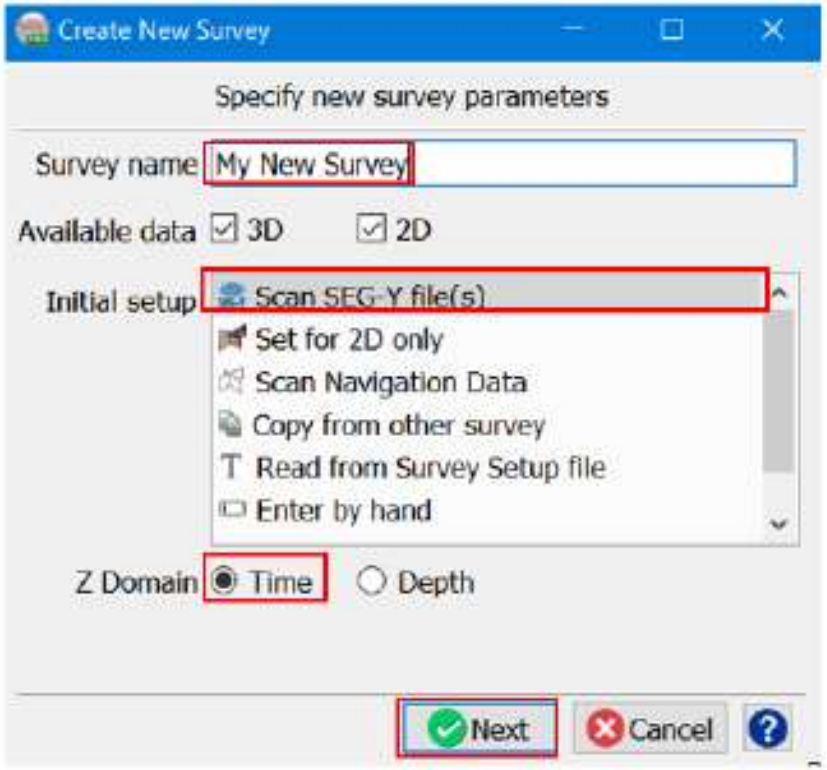
1.2.2a设置调查和加载SEG-Y文件

3. **Specify** a Survey name and

(a) **select** Scan SEG-Y file(s),

(b) **set** Time for Z Domain, 时间

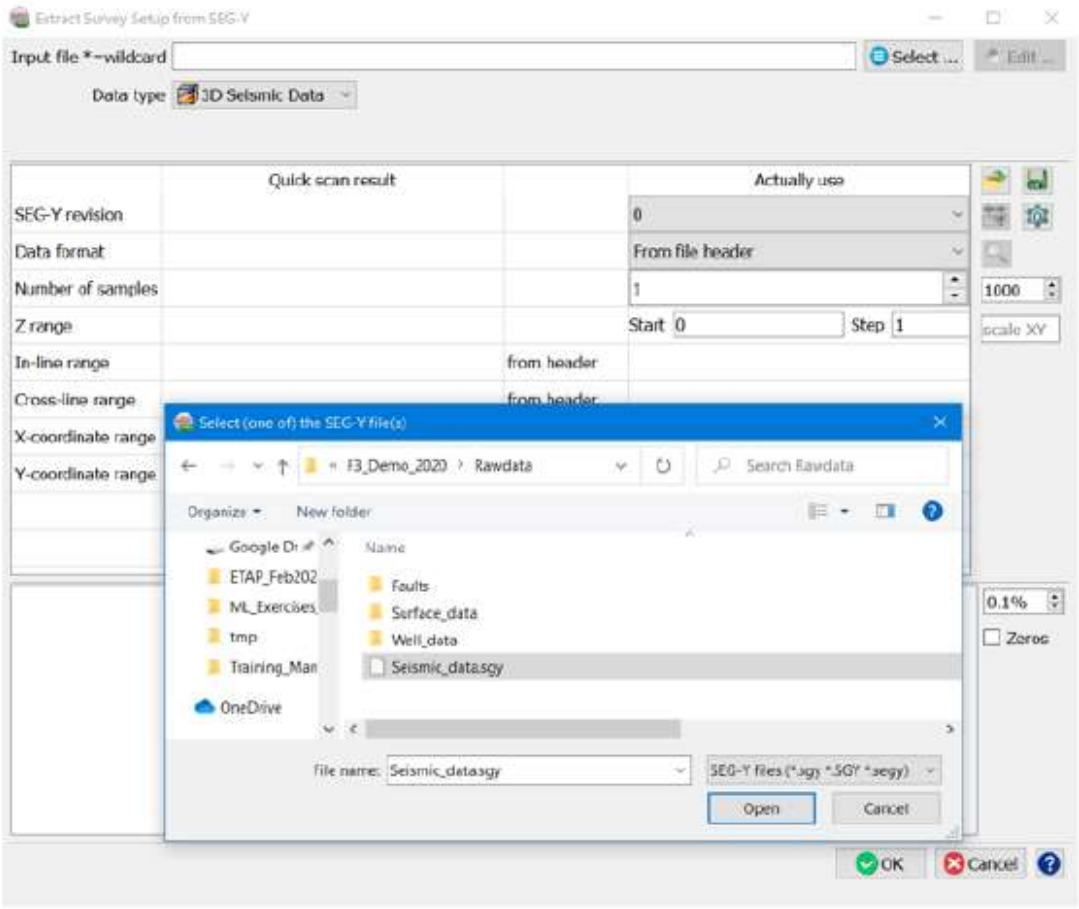
(c) **Press** Next.



OpendTect display scenes are in Time or Depth. Transformation is done on-the-fly using a given velocity model. In the Survey Setup you choose the primary Z Domain. In the case of depth survey, Z Domain should be *Depth*. 时间-深度转换

1.2.2a设置调查和加载SEG-Y文件

4. **Go** to the Rawdata directory of F3 Demo and **Select** the Input SEG-Y file: \Raw data\Seismic_data.sgy.

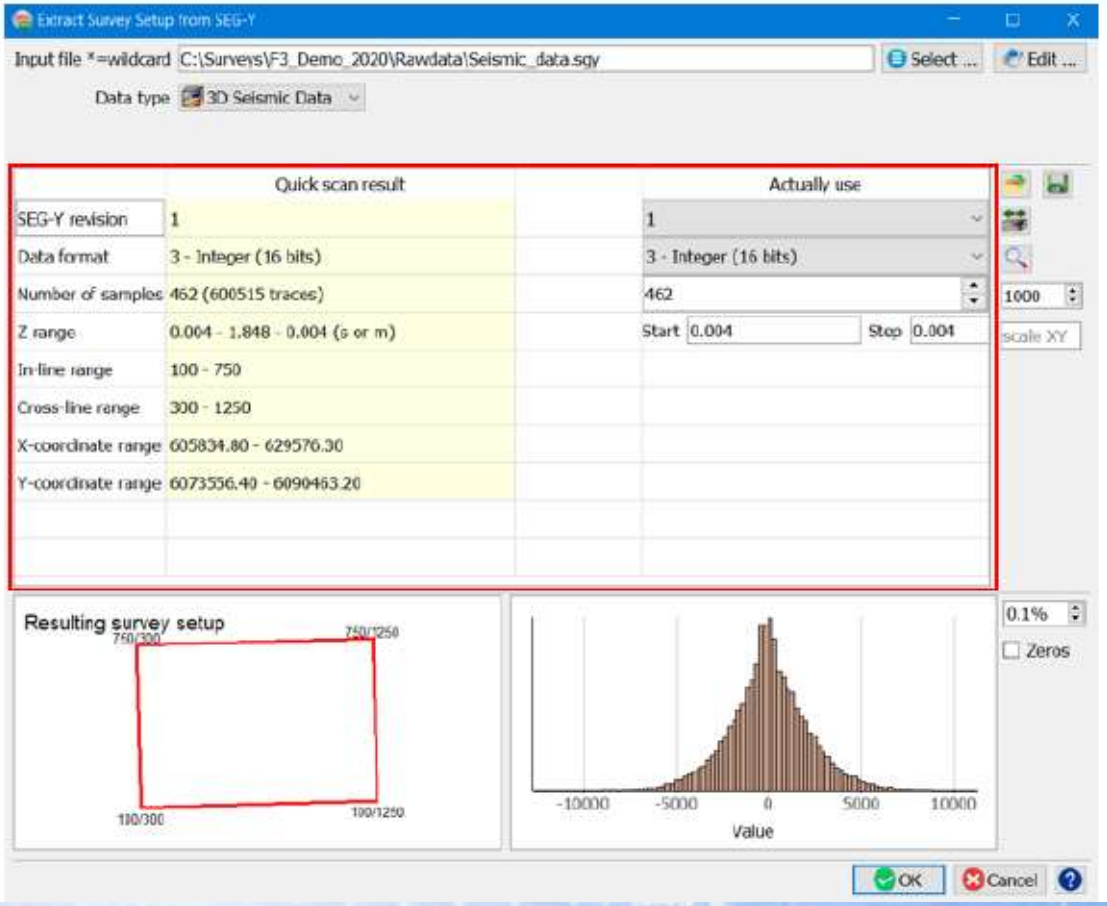


1.2.2a设置调查和加载SEG-Y文件

5. The import wizard makes a quick scan of the SEG-Y volume and automatically fills-in relevant parameters for survey set-up and import.

If needed, the parameters required for SEG-Y import (under the *Actually Use* column) can be changed manually.

The bottom part shows the extracted geometry of the survey and the histogram of seismic amplitudes from the quick scan of the input SEG-Y volume.



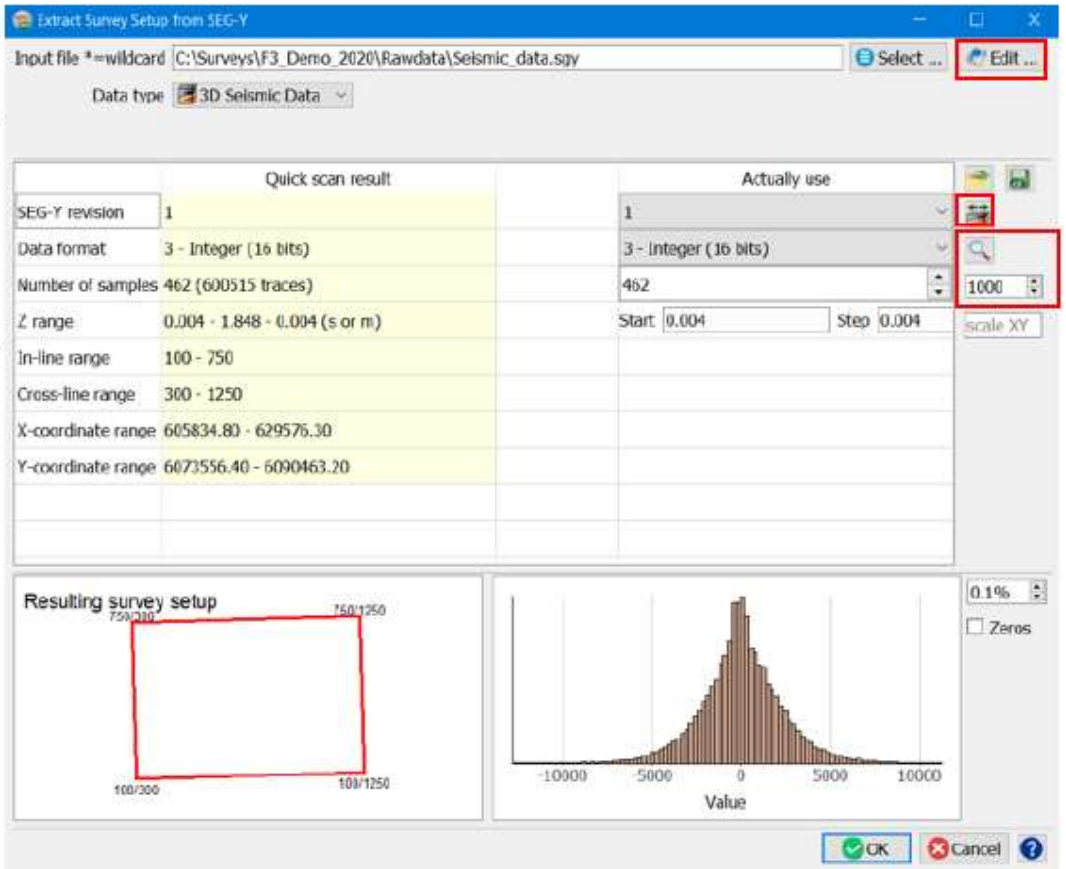
1.2.2a设置调查和加载SEG-Y文件

6. Optionally, **click** on the  icon to scan the entire input SEG-Y file.

7. **Click** on the  icon to examine in detail, first '1000' traces (changeable) of the file.

Edit option can be used if the SEG-Y file needs to be modified. You can update binary headers and trace headers using mathematical formulae and information from other headers.

Scanning the entire SEG-Y file is useful when the survey geometry extracted from the quick scan looks doubtful.



1.2.2a设置调查和加载SEG-Y文件

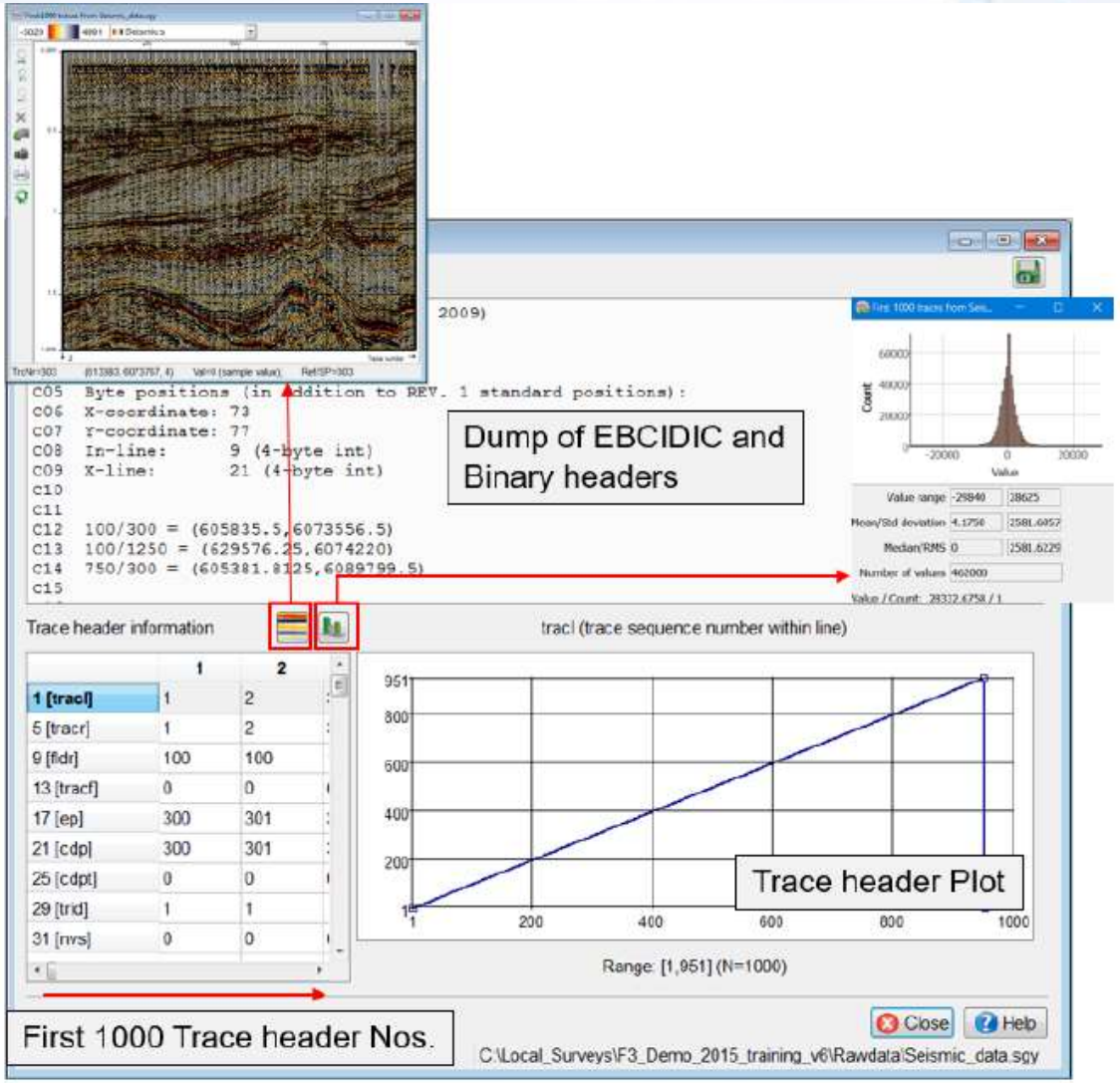
Workflow cont'd:

8. Examiner window: **Use** this to find out what is inside the file.

9. **Check** the Inline, Crossline and X/Y coordinates : **find** the corresponding byte and **observe** the associated plot.

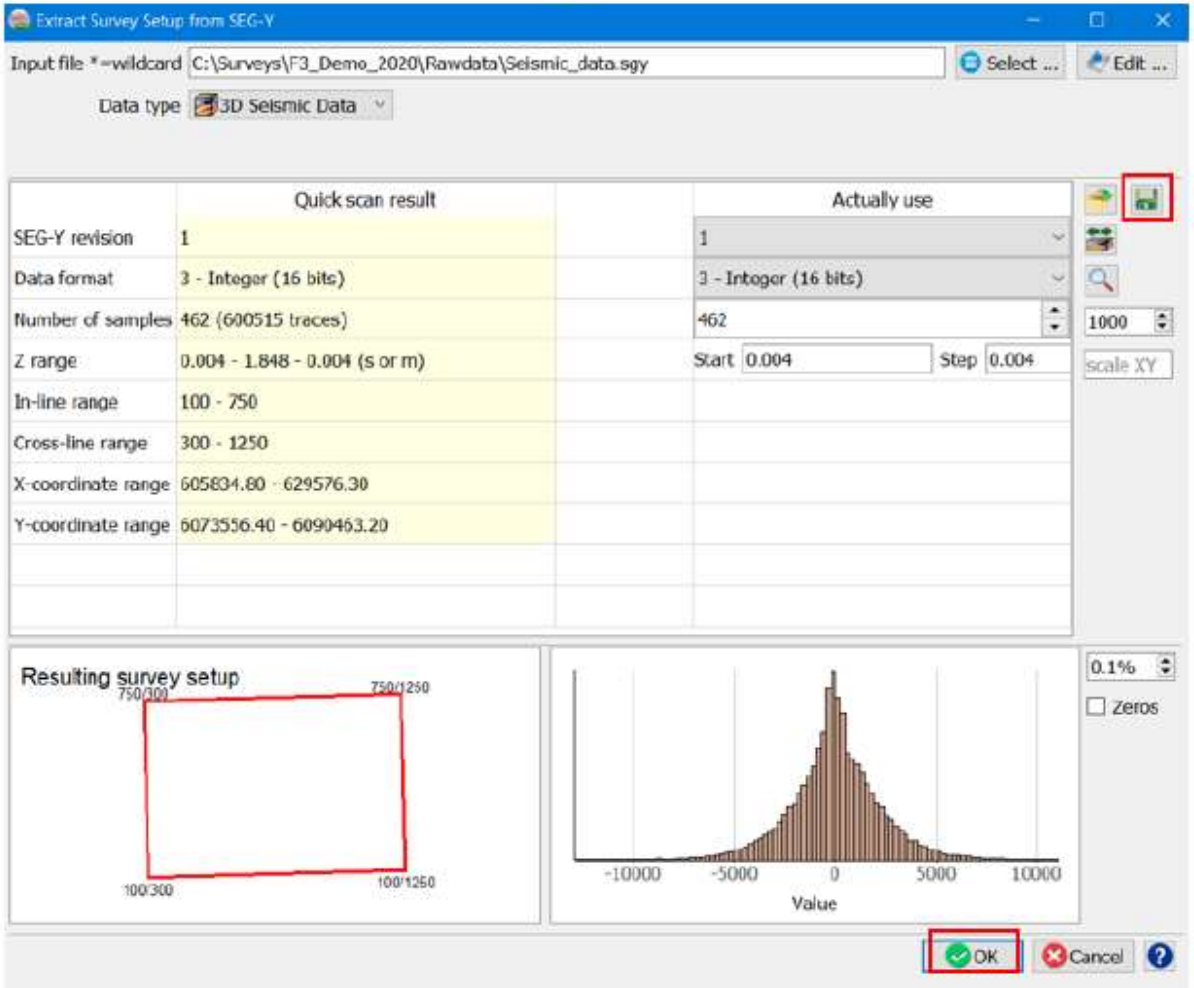
10. Optionally, **check** Seismic viewer and histogram windows.

Trace header name + byte position.



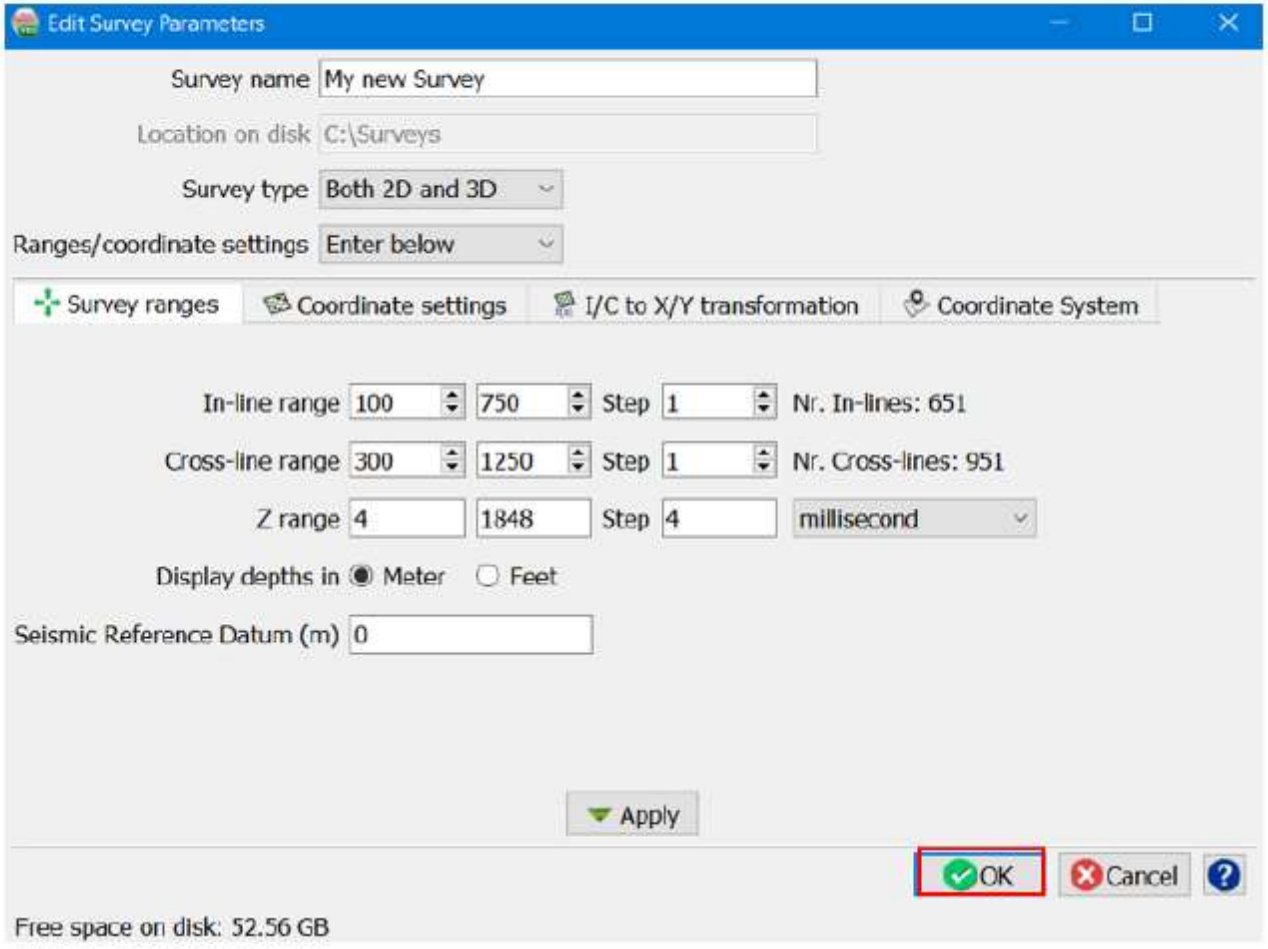
1.2.2a设置调查和加载SEG-Y文件

11. Click on OK. Optionally, **click** on the icon to save the import set-up parameters.



1.2.2a设置调查和加载SEG-Y文件

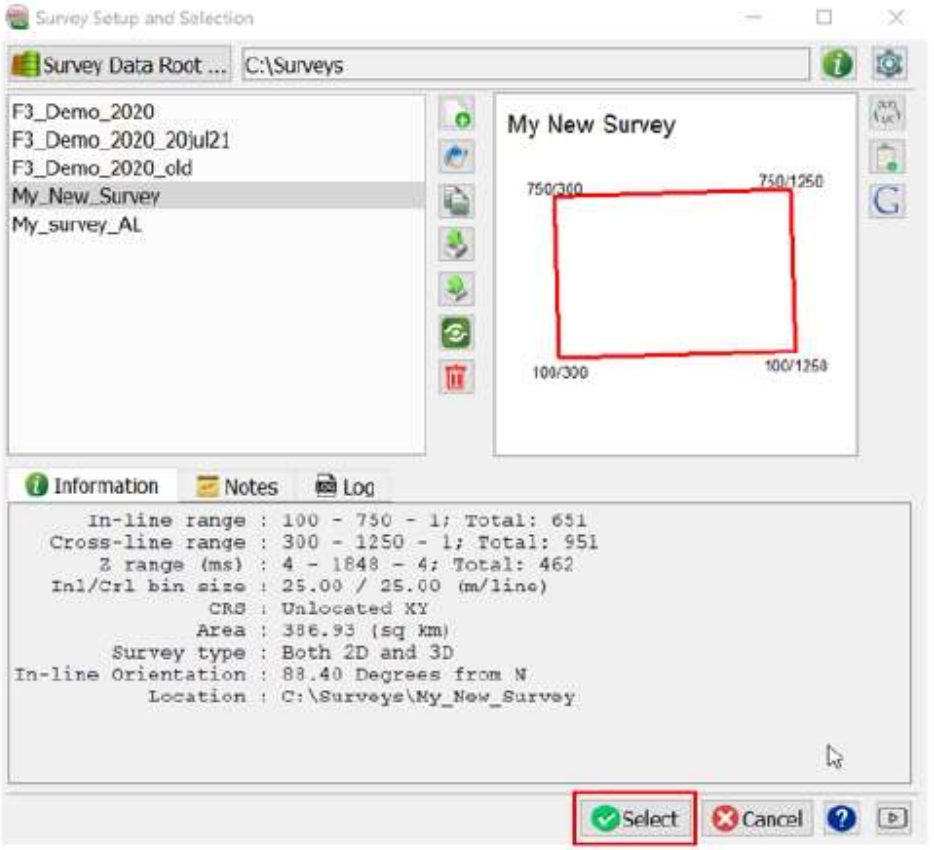
12. Survey definition is set now. **Click** on OK to proceed further.



1.2.2a设置调查和加载SEG-Y文件

13. **Go** inside the newly created survey by either **double-clicking** on it or **clicking** on Select.

14. **Press** Yes when asked to import the SEG-Y file used to set-up the survey.

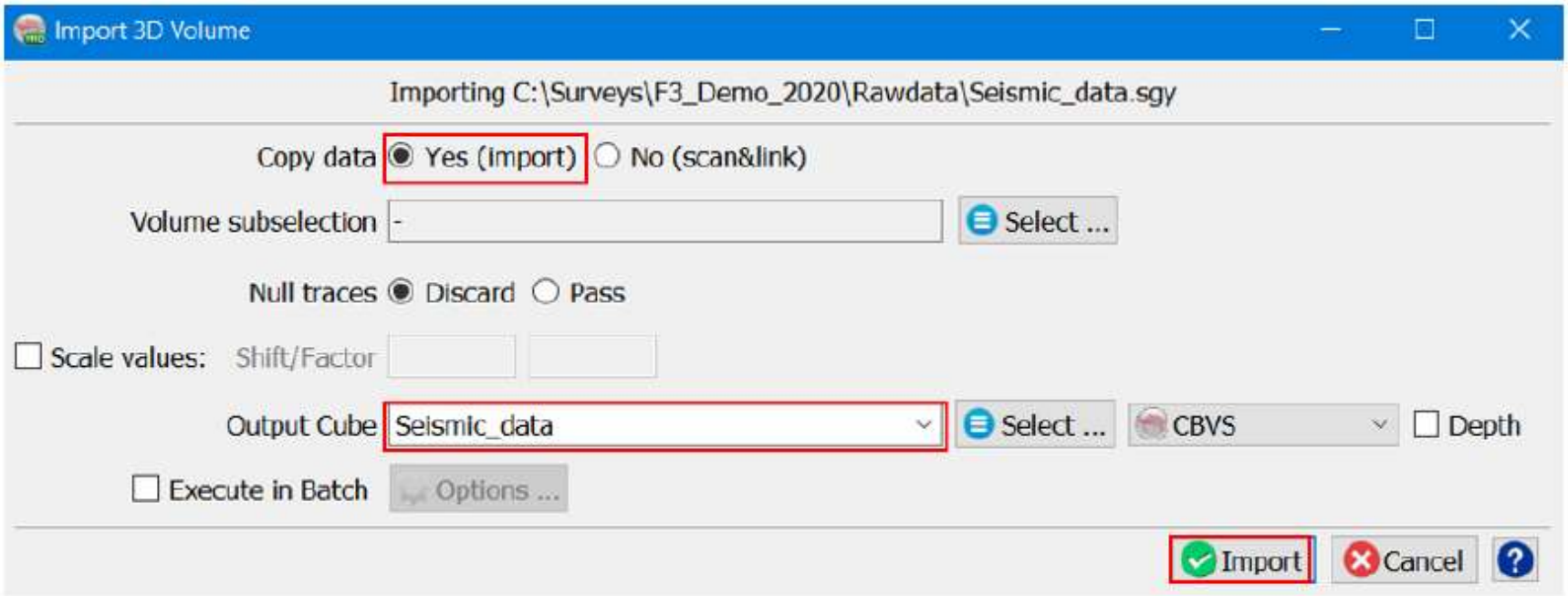


1.2.2a设置调查和加载SEG-Y文件

15. **Keep** the default Yes (import) toggled on, in front of Copy data. Optionally, it is possible to make a link to the input SEG-Y file in OpendTect.

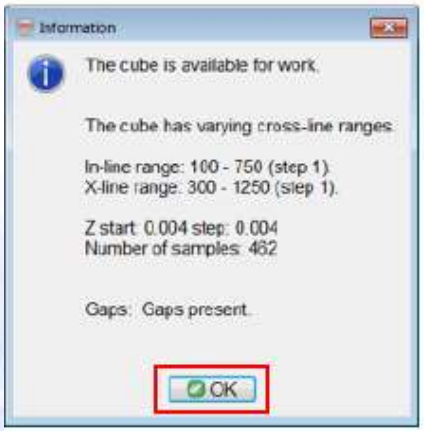
16. **Specify** an Output Cube name (by default name of the input file is copied here).

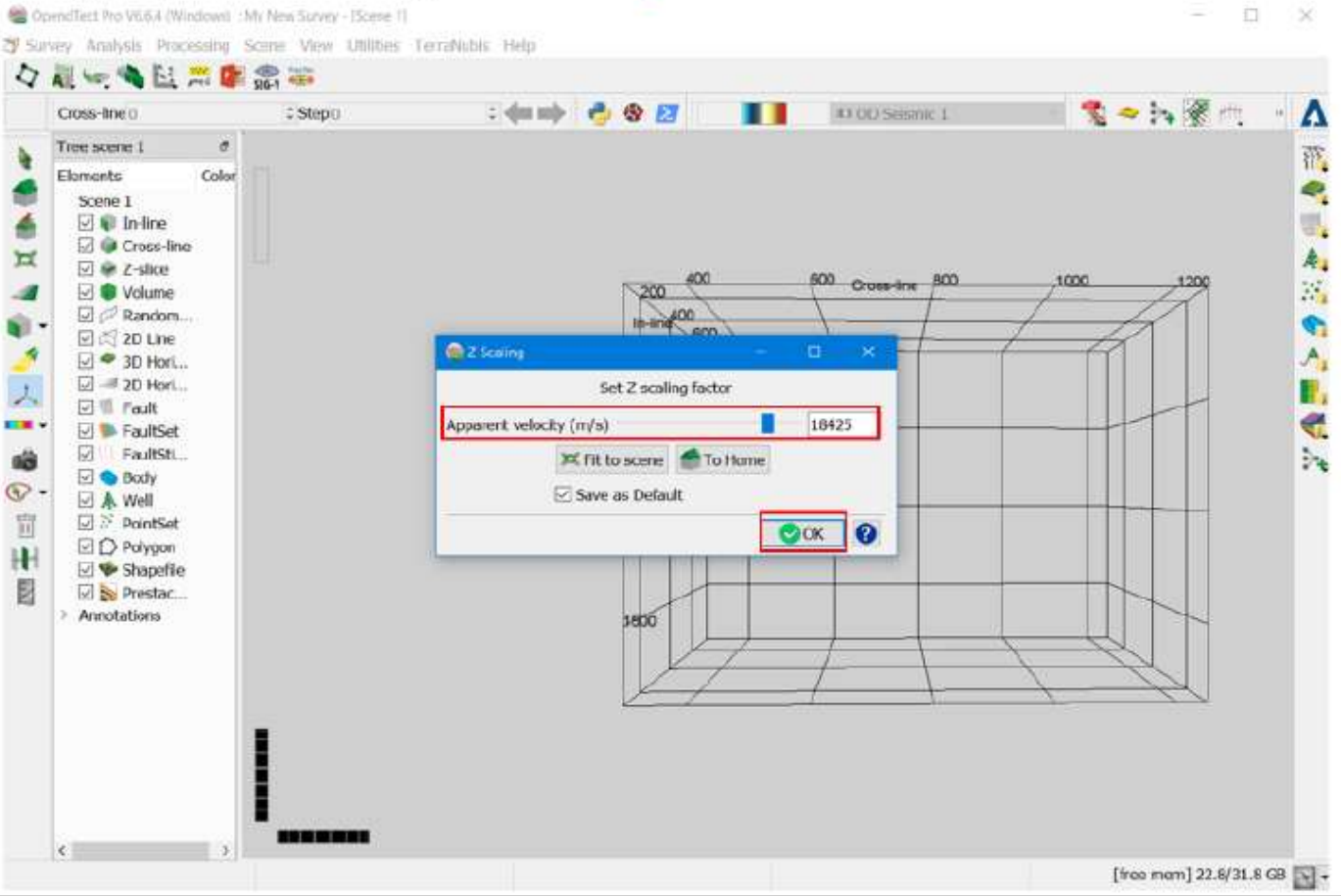
17. **Press** Import.



1.2.2a设置调查和加载SEG-Y文件

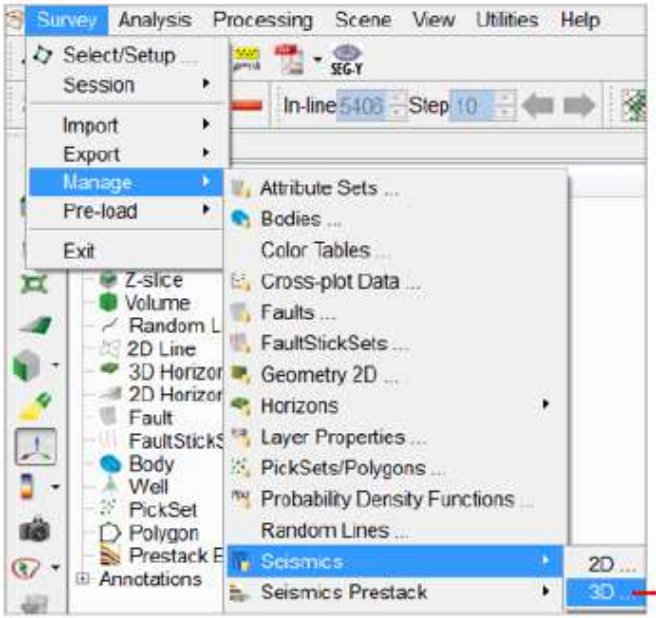
18. Once the import is finished, **press** OK on the notification window. Next, OpendTect will automatically open the option to change the Z-scaling of the newly created survey. **Move** the slider to set an appropriate Z scaling factor and **press** OK.

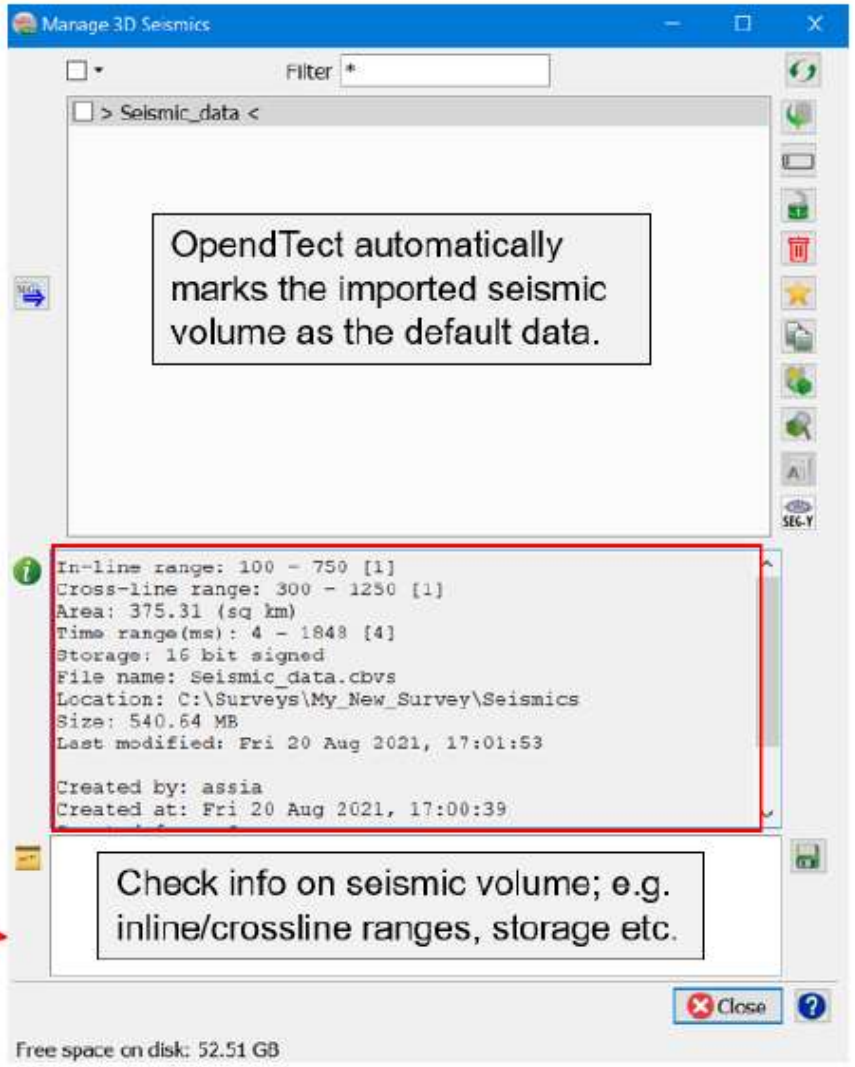




1.2.2a设置调查和加载SEG-Y文件

19. **Check** in the seismic manager the newly imported cube; Survey > Manage > Seismic > 3D.

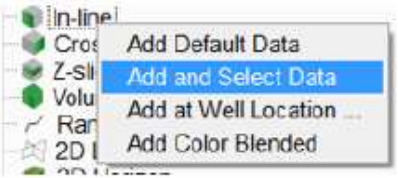




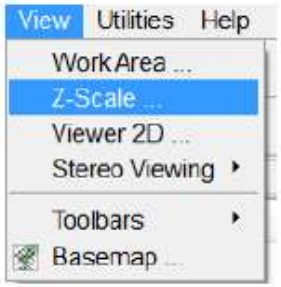
1.2.2a设置调查和加载SEG-Y文件

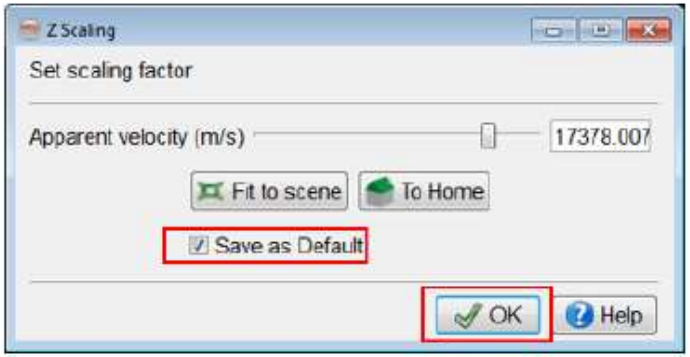
Tips:
- Changing the default Z-scale setting manually at any time
- Saving color settings with the loaded data set
- Manually making a seismic cube the default data set

Changing the Z-scale at any time:



1. Add an inline:
   - **Right-click** in the tree on Inline > Add and Select Data.
   - **Left-click** on the selected seismic data or **press** OK in the window that pops-up after step 1.
2. **Go to** View > Z-scale.
3. **Use** the slider to change Z. **Toggle on** Save as default and **press** OK.

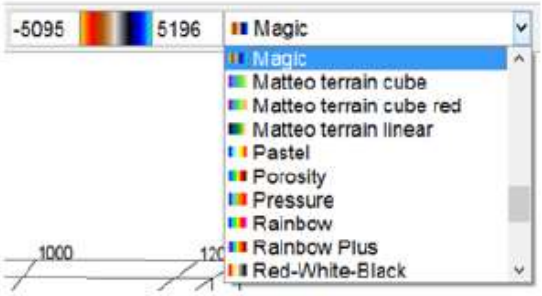


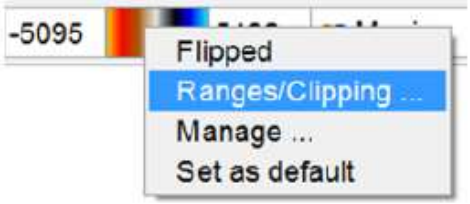


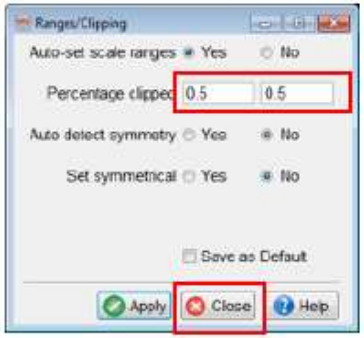
1.2.2a设置调查和加载SEG-Y文件

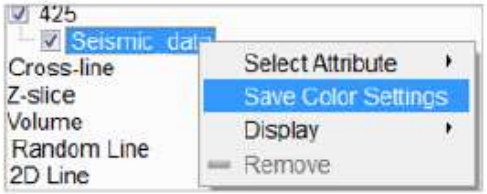
Saving color settings with stored volumes:

1. **Select** a color bar.
2. **Right-click** on the color-bar and **select** Ranges/Clipping.
3. **Change** the Percentage clipped and **Apply** a few times. When satisfied **Press** Close.
4. By default, clipping is used meaning every line will be scaled slightly different. To set the extreme values: **manually overwrite** the values next to the color bar and **press** Enter.
5. **Right-click** on an attribute in the tree and **select** Save Color (& scaling) Settings to save it as default for this attribute.





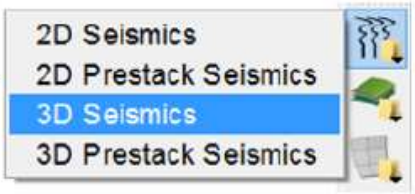




1.2.2a设置调查和加载SEG-Y文件

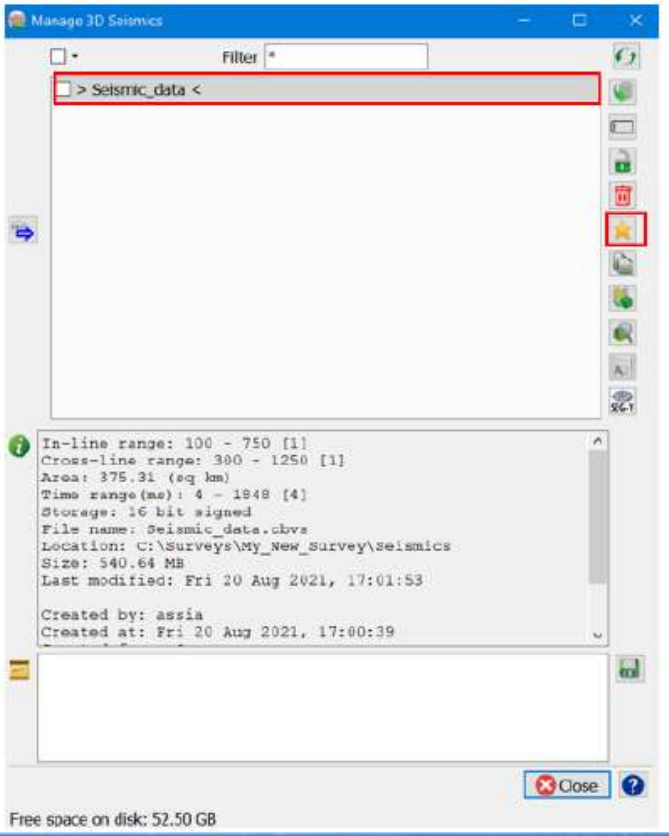
Workflow cont'd:

This is just for information purpose and is not part of the current exercise.



Manually setting a default data set :

1. **Press** the Manage Seismic icon and **Select** 3D Seismics or **go to** Survey > Manage > Seismics > 3D.
2. **Select** a Seismic data set from the list and **click** on the Default ⭐ icon. The default file is marked by the >< symbol.



The advantage of having a default data set is that it saves many clicks to select data in various places in OpendTect. For example in this exercise we used option "Add and Select " to see the data. We then had to select the data. From now on we can use "Add default data" for in-lines, crosslines and Z-slices.

1.2.2b加载SEG-Y文件

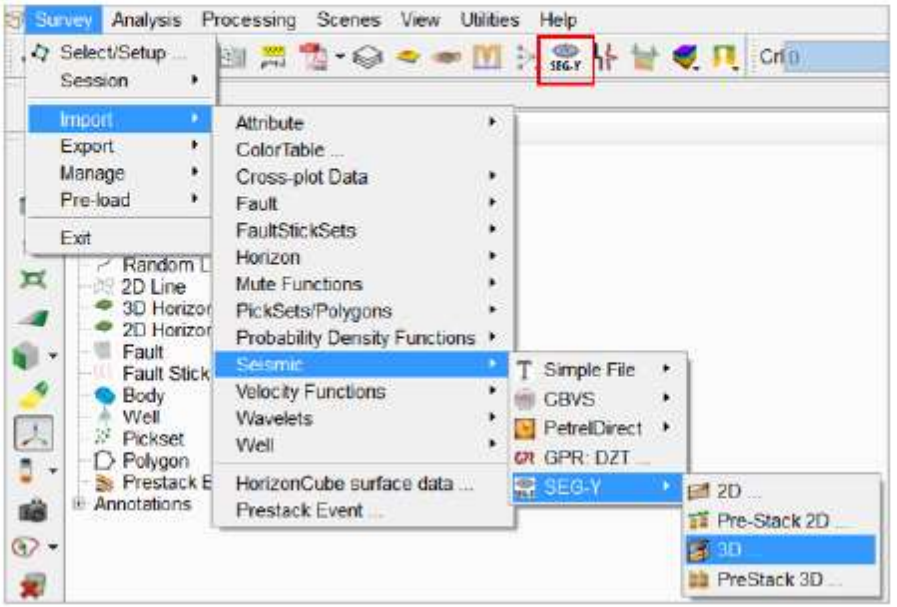
这里的加载SEG-Y文件，是在已经建立好了调查项目的基础上，加载额外的地震数据（2D或3D）。

Exercise objective:
Load a seismic SEG-Y volume in OpendTect.

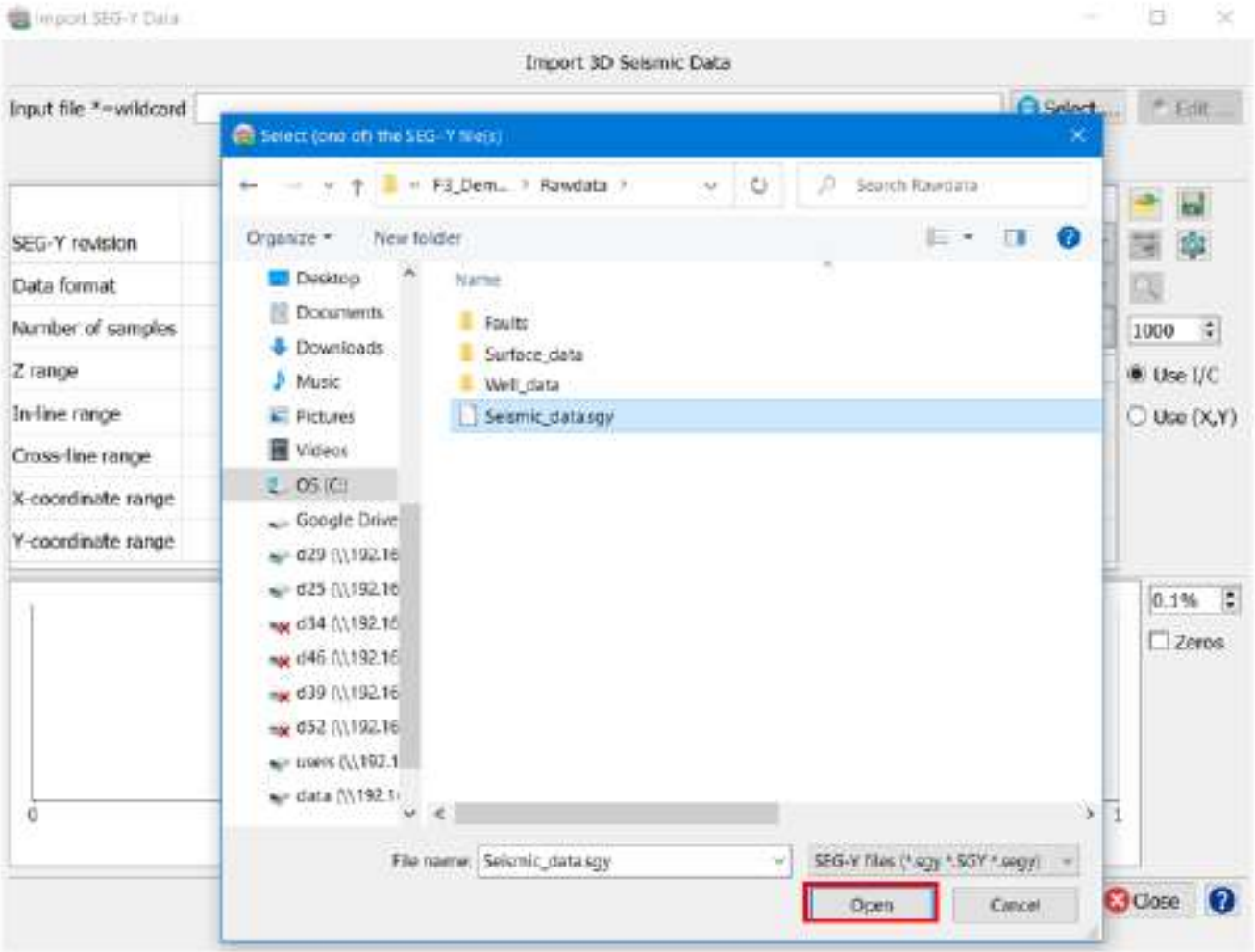
Workflow:

1. **Go to** Survey > Import > Seismic > SEG-Y > 3D

   or **click** on the SEG-Y import icon SEG-Y in the OpendTect main toolbar.



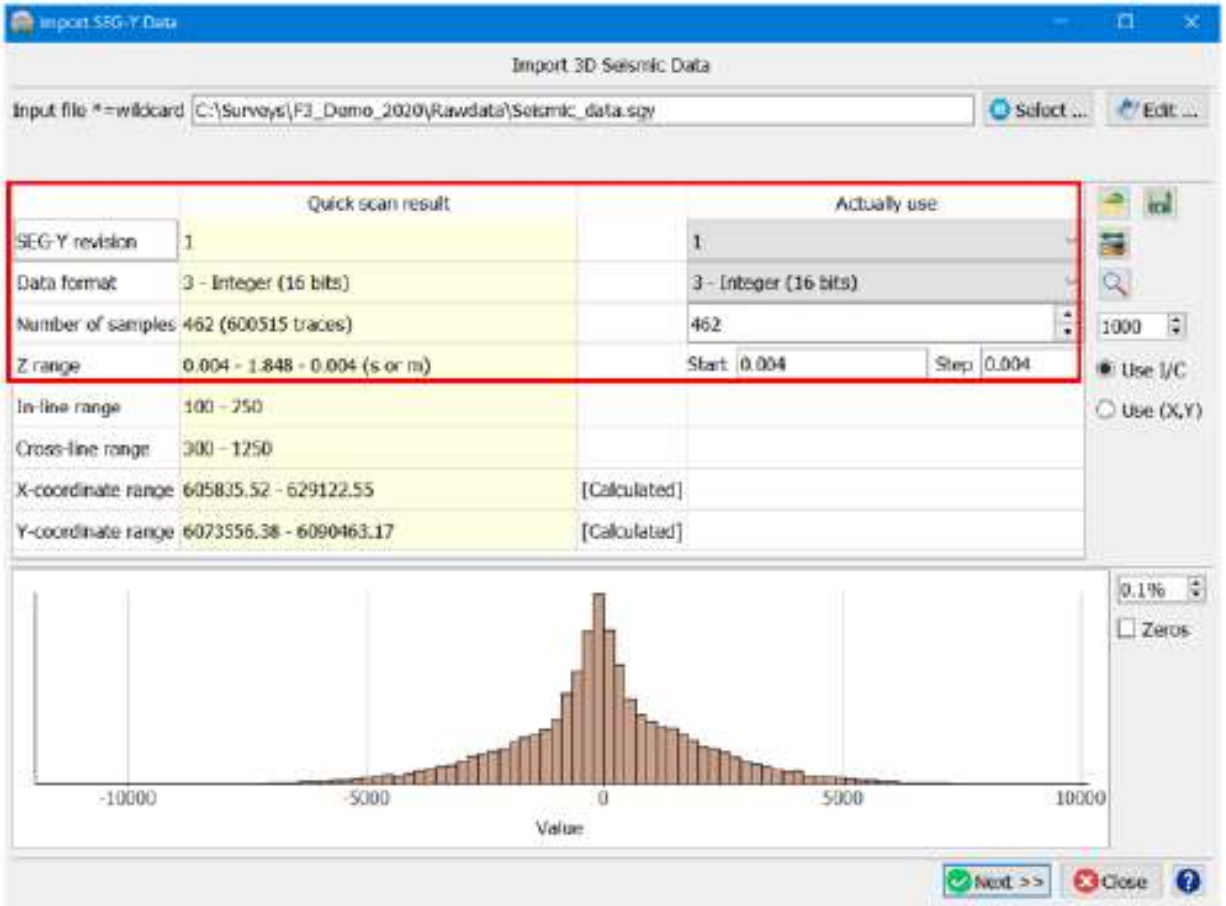
2. **Go** to the Rawdata directory of F3 Demo and **Select** the Input SEG-Y file: \Raw data\Seismic_data.sgy.



3. The import wizard makes a quick scan of part of the seismic volume and automatically fills in relevant parameters required for import.

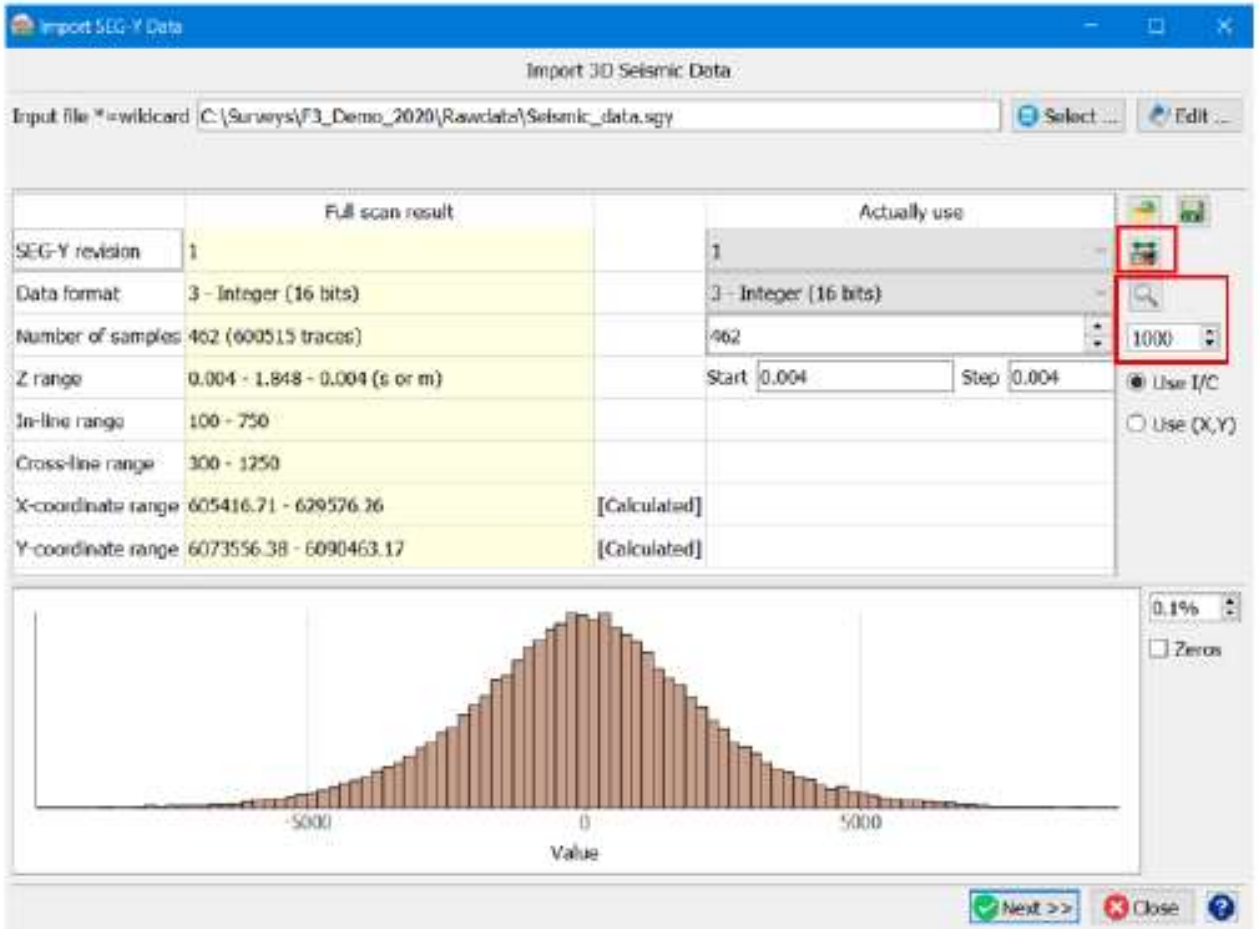
If needed, the parameters required for SEG-Y import (under the *Actually Use* column) can be changed manually.

In the bottom part, histogram of seismic amplitudes of traces used for the quick scan can be seen.



4. Optionally, click on the  icon to scan the entire input SEG-Y file.

5. **Click** on the  icon to examine in detail, first '1000' traces (changeable) of the file.



Now in the bottom part, histogram of seismic amplitudes of all the traces in the input SEG-Y volume can be seen.

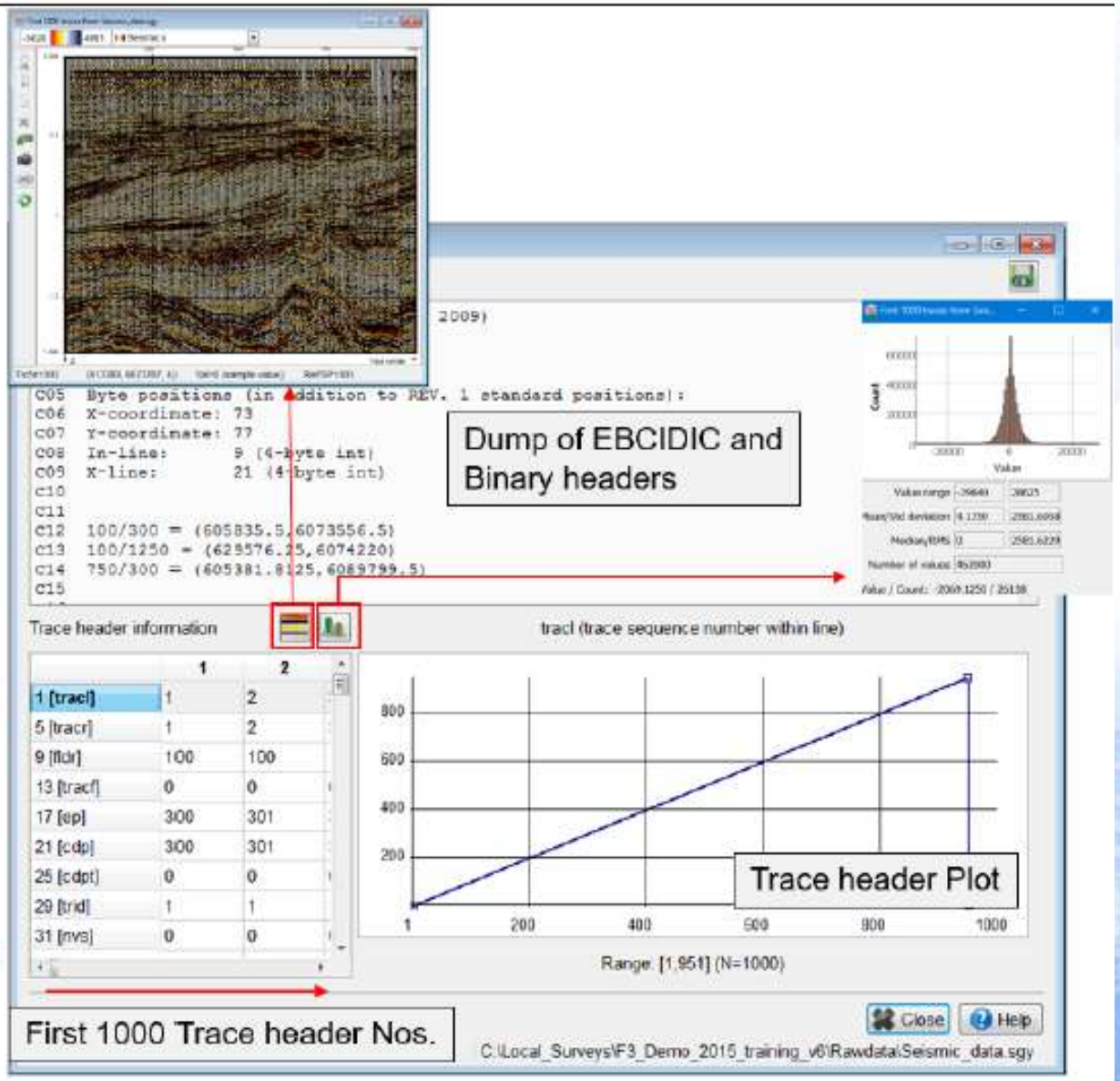
Workflow cont'd:

6. Examiner window: **Use** this to find out what is inside the file.

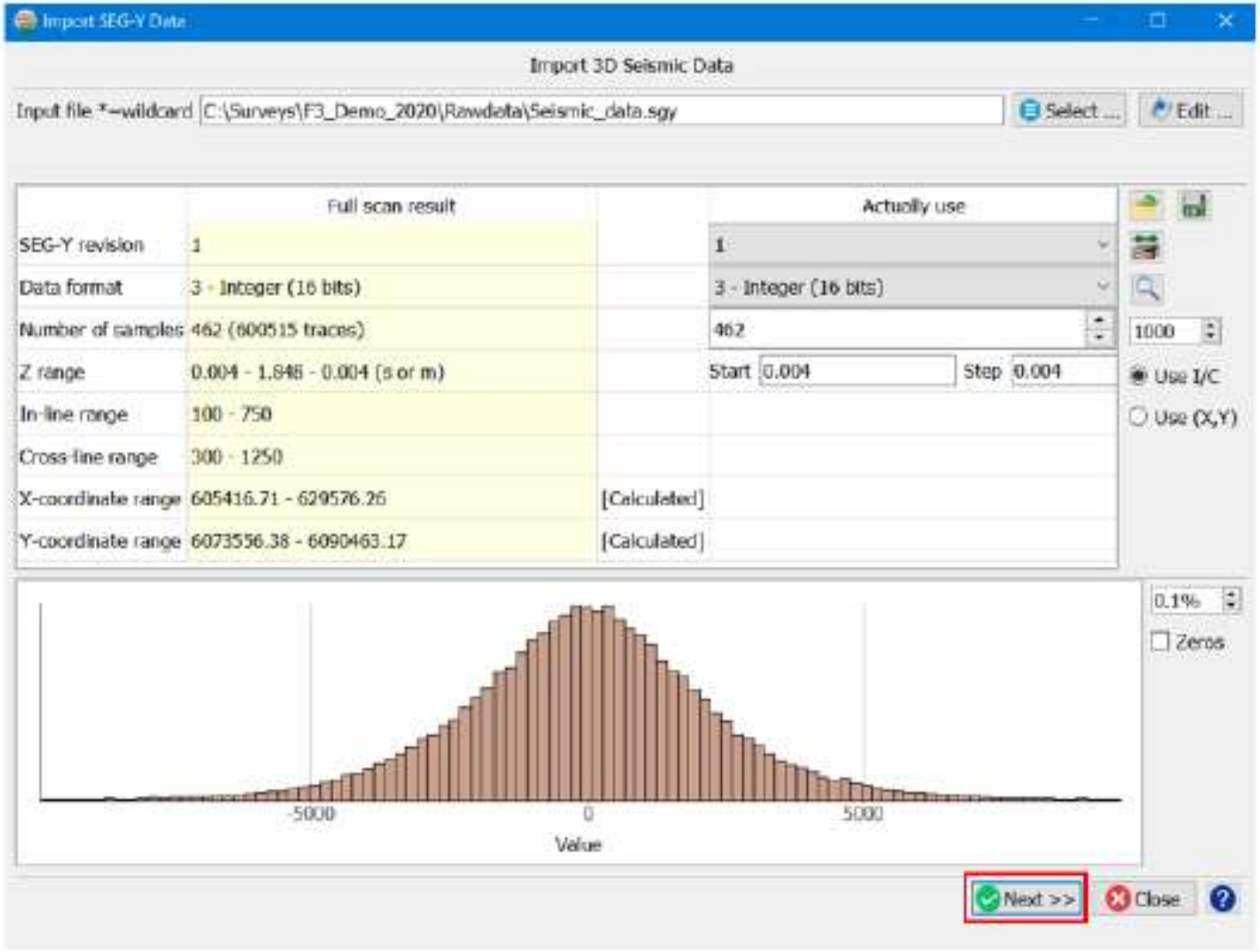
7. **Check** the Inline, Crossline and X/Y coordinates : **find** the corresponding byte and **observe** the associated plot.

8. Optionally, **check** Seismic viewer and histogram windows.

Trace header name + byte position



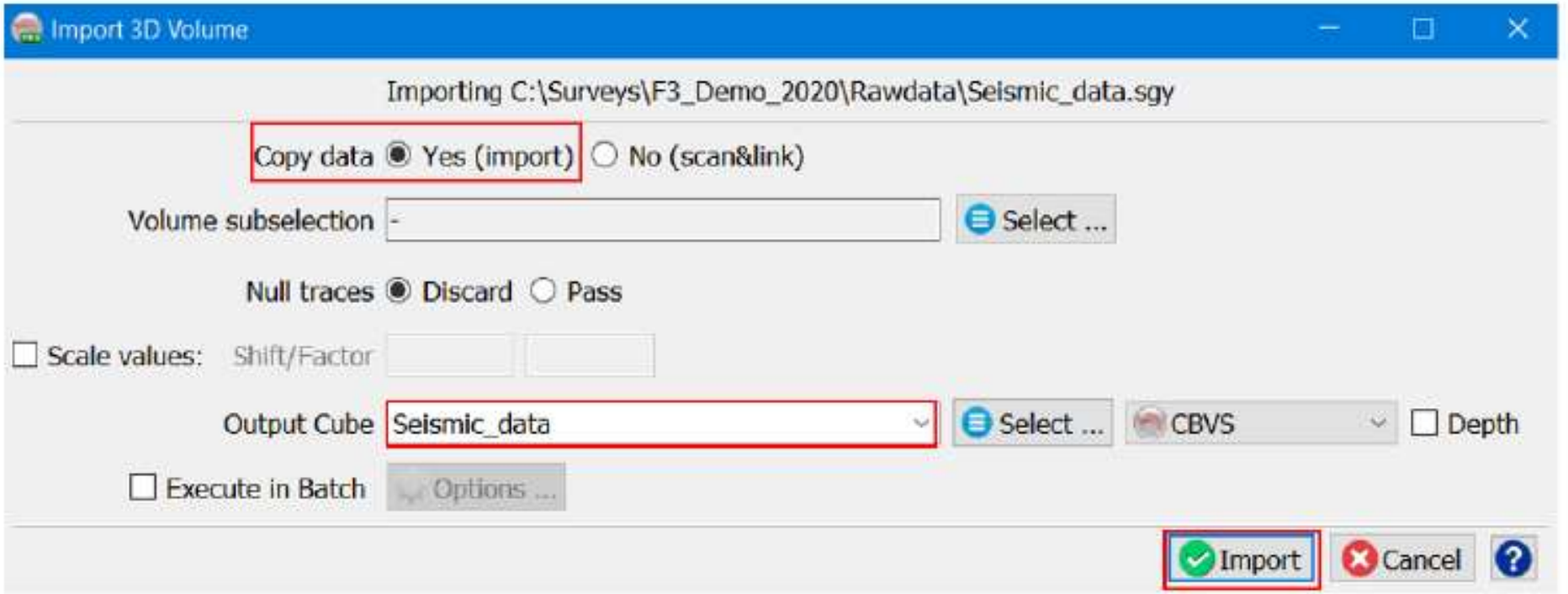
9. **Click** on Next in the Import SEG-Y Data window.



10. **Keep** the default Yes (import) toggled on, in front of Copy data. Optionally, it is possible to make a link to the input SEG-Y file in OpendTect.

11. **Specify** an Output Cube name (by default name of the input file is copied here).

12. **Press** Import.



13. **Close** the Import SEG-Y Data window.

14. **Check** in the seismic manager the newly imported cube; Survey > Manage > Seismic > 3D.