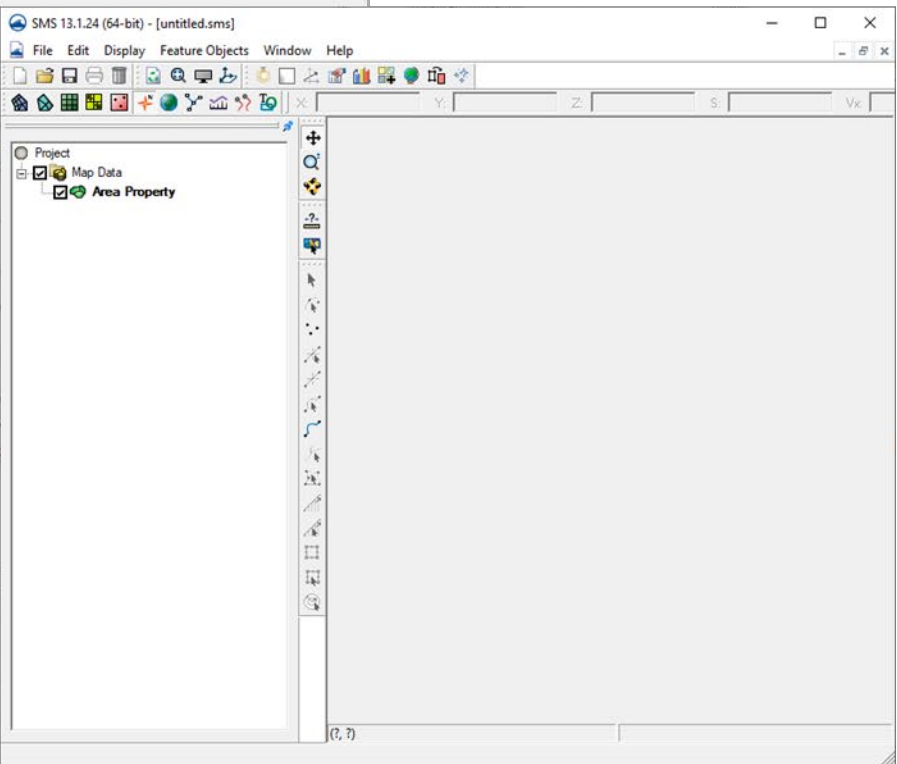
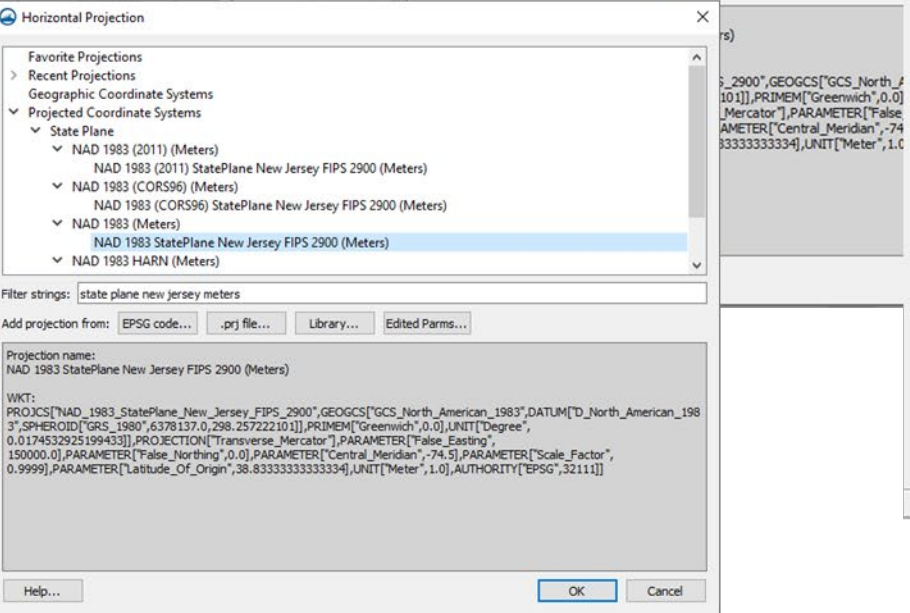
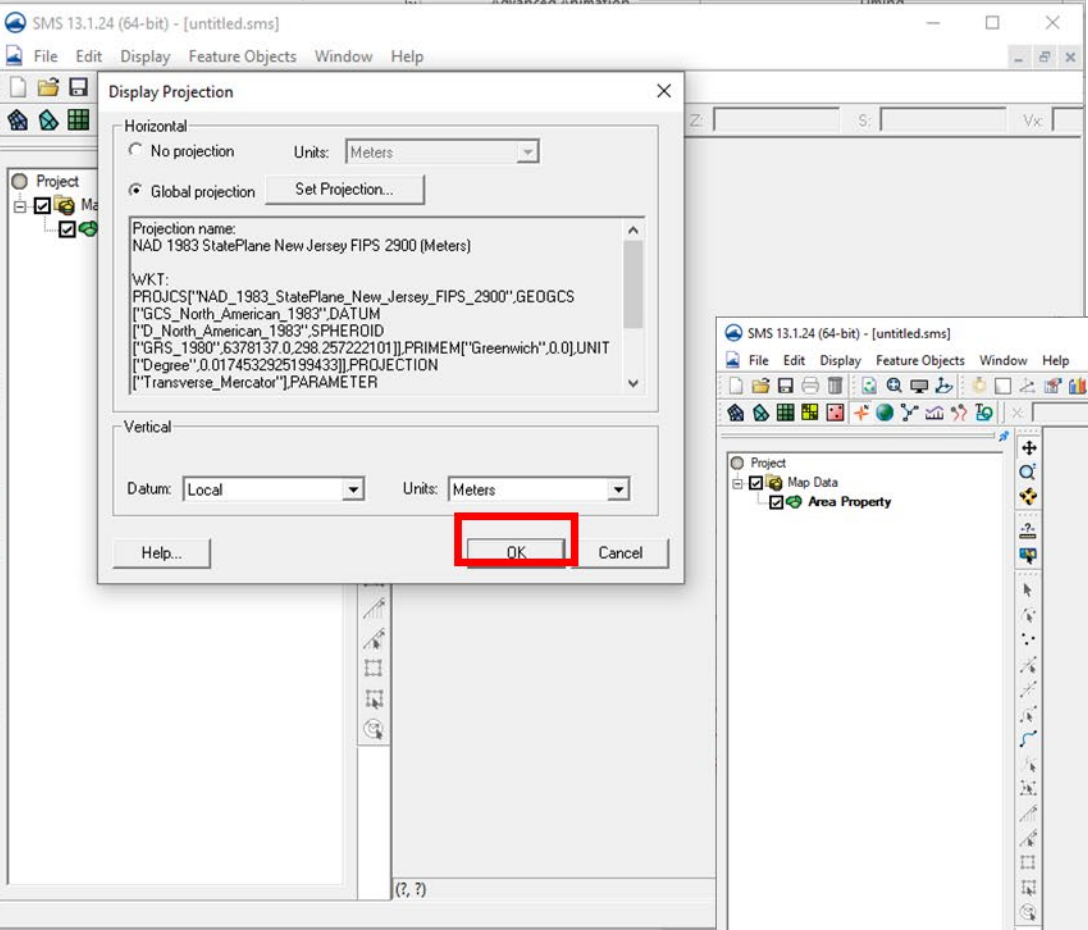
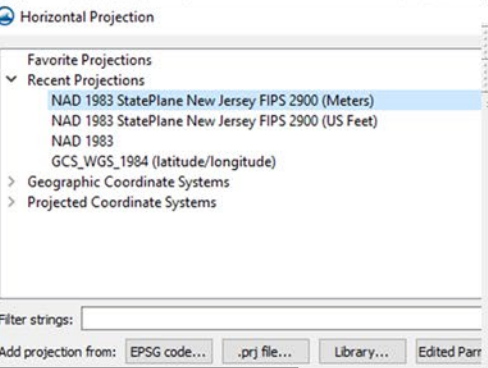
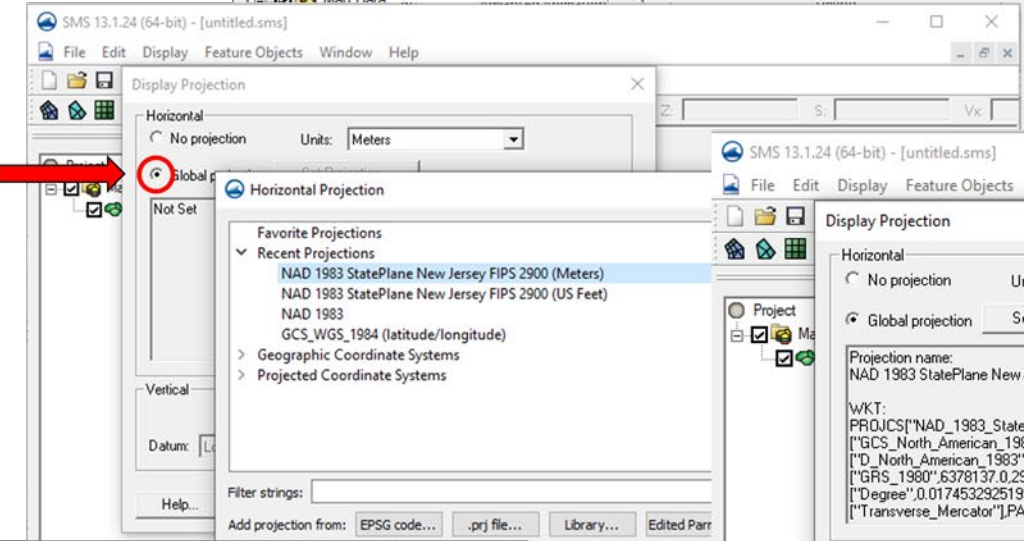
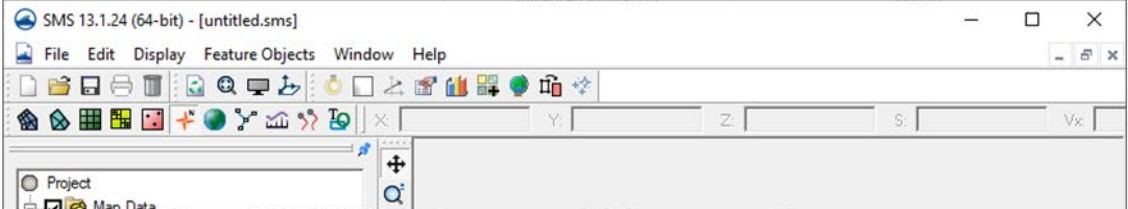


Working with Bathymetry

- Loading Surveys
- Horizontal Projection
- Vertical Datums
- Merging Datasets



Name	Date
Merged	
0.75m_Contour.xyz	4/1
3364_0409_ft_MLW.xyz	4/1
Channel_Survey_NJ-DEP_0609_ft_MLW.xyz	4/1
Coastal_Relief_Model_II_m_msl.pts	4/1
Field_Team_Measurements_0809_m_NAV...	4/1
LIDAR_ft_NAVD.xyz	4/1

SMS 13.1.24 (64-bit) - [untitled.sms]

File Edit Display Data Vertices Breaklines Triangles Scatter Window Help

Project Scatter Data

Projection - Project\Scatter Data\0.75m_Contour

Horizontal

☐ No projection ☐ Units: []

☒ Global projection Set Projection...

Projection name:
NAD 1983 StatePlane New Jersey FIPS 2900 (Meters)

WKT:
PROJCS["NAD_1983_StatePlane_New_Jersey_FIPS_2900",GEOGCS["GCS_North_American_1983",DATUM["D_North_American_1983",SPHEROID["GRS_1980",6378137,0.298,257222101]],PRIMEM["Greenwich",0.0],UNIT["Degree",0.0174532925199433]],PROJECTION["Transverse_Mercator"],PARAMETER

Vertical

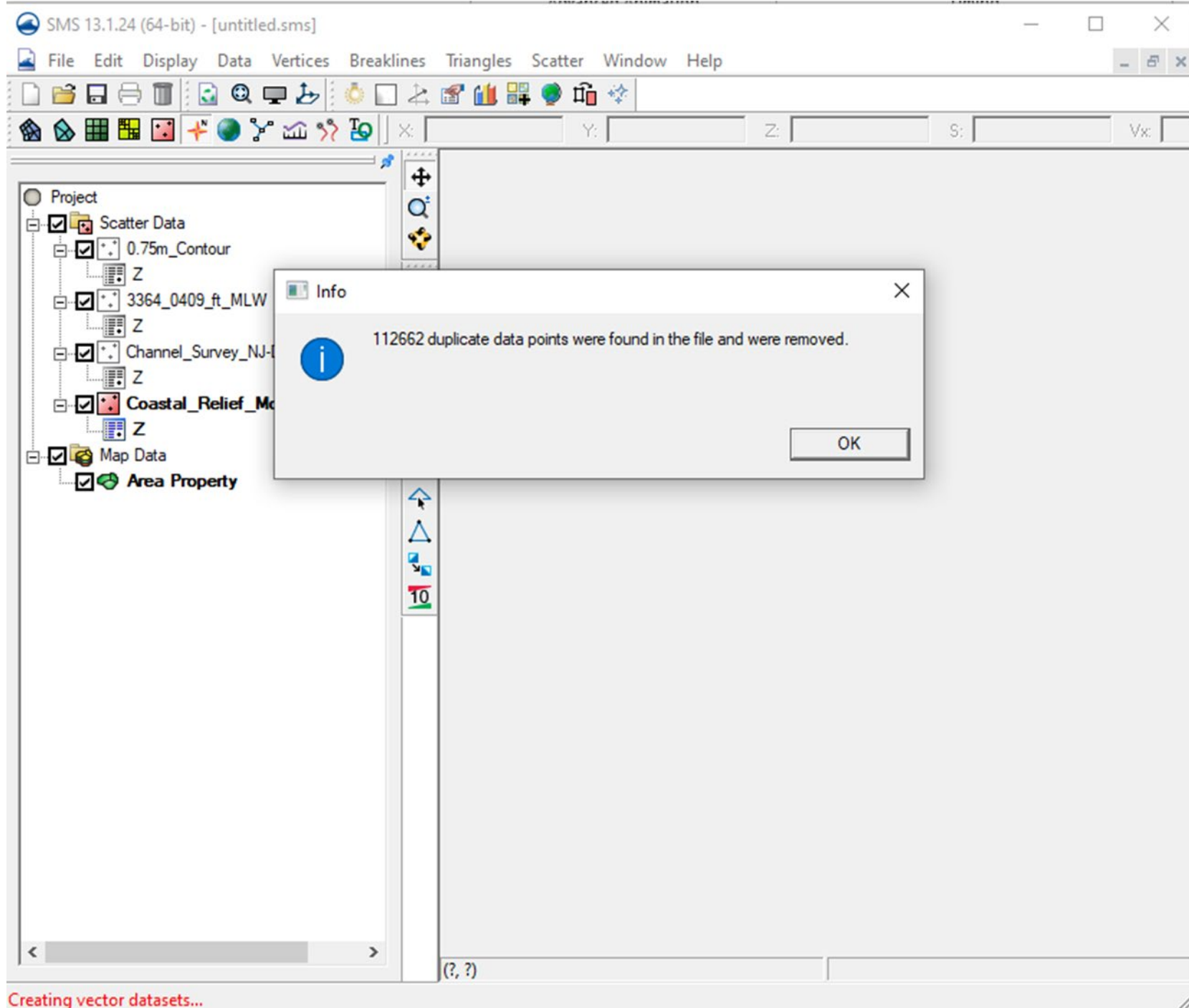
Datum: [] Units: Meters

OK Cancel

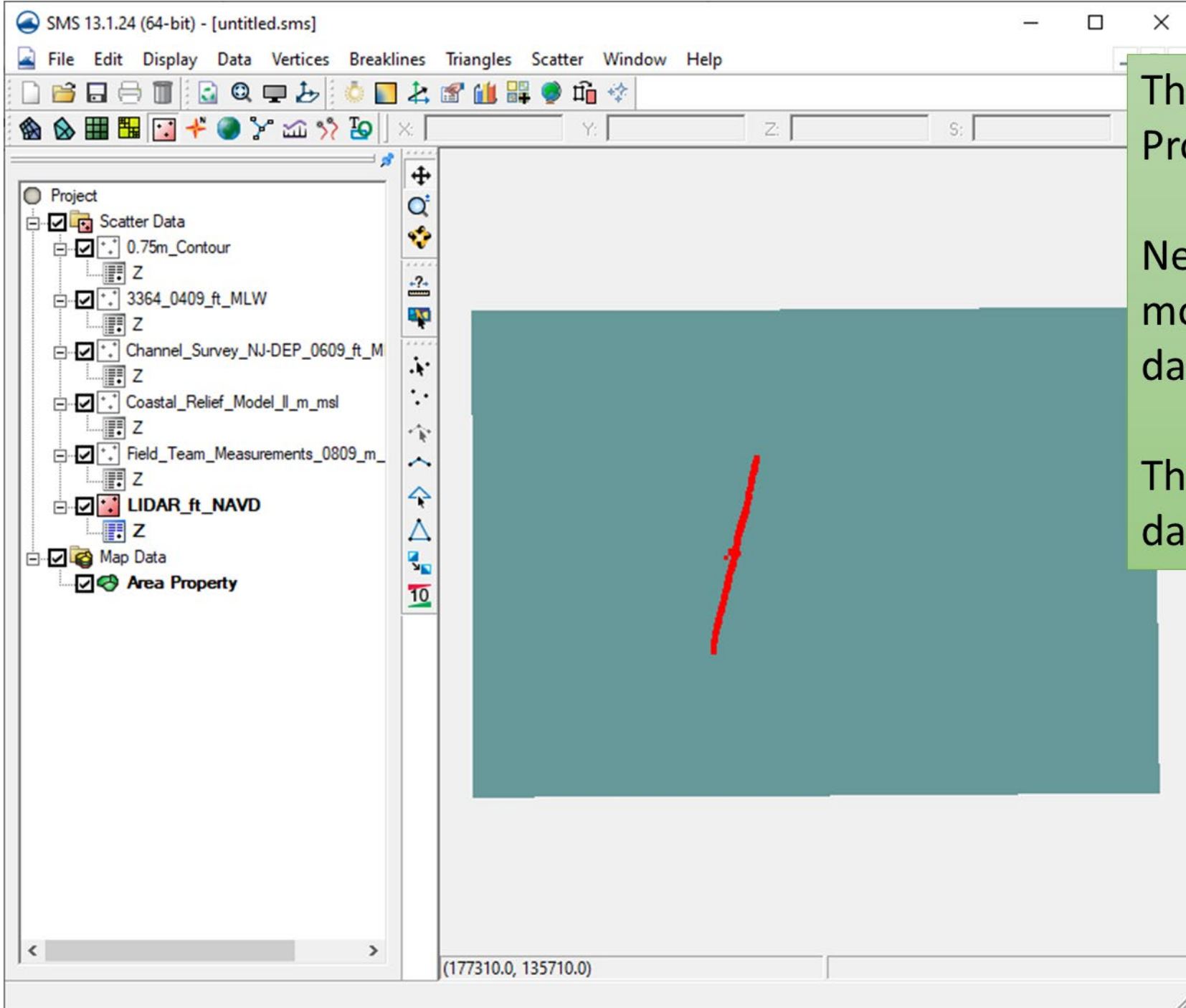
(?, ?)

Choose the correct individual projection for each survey dataset. Make sure you get the right Units.

Filename	Horizontal Projection information
Channel_Survey_NJ- DEP_0609_ft_MLW.xyz	State Plane, New Jersey, U.S. Feet, NAD83
Coastal_Relief_Model_II_m_msl	Geographic (Lat/Long), Arc Degrees, NAD83
3364_0409_ft_MLW.xyz	State Plane, New Jersey, U.S. Feet, NAD83
LIDAR_ft_NAVD	State Plane, New Jersey, U.S. Feet, NAD83
Field_Team_Measurements_0809_m_NAVD.xyz	State Plane, New Jersey, Meters, NAD83
0.75m_Contour	State Plane, New Jersey, Meters, NAD83



Creating vector datasets...

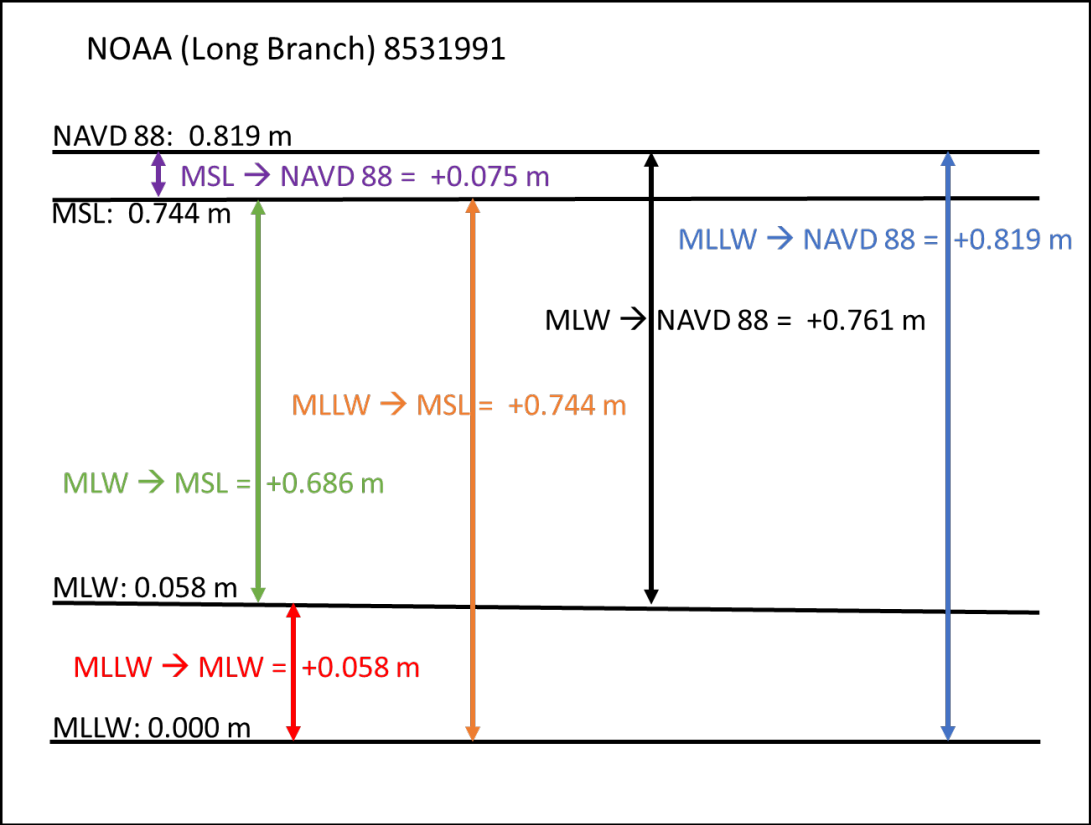


This has modified the Horizontal Projection of the selected files.

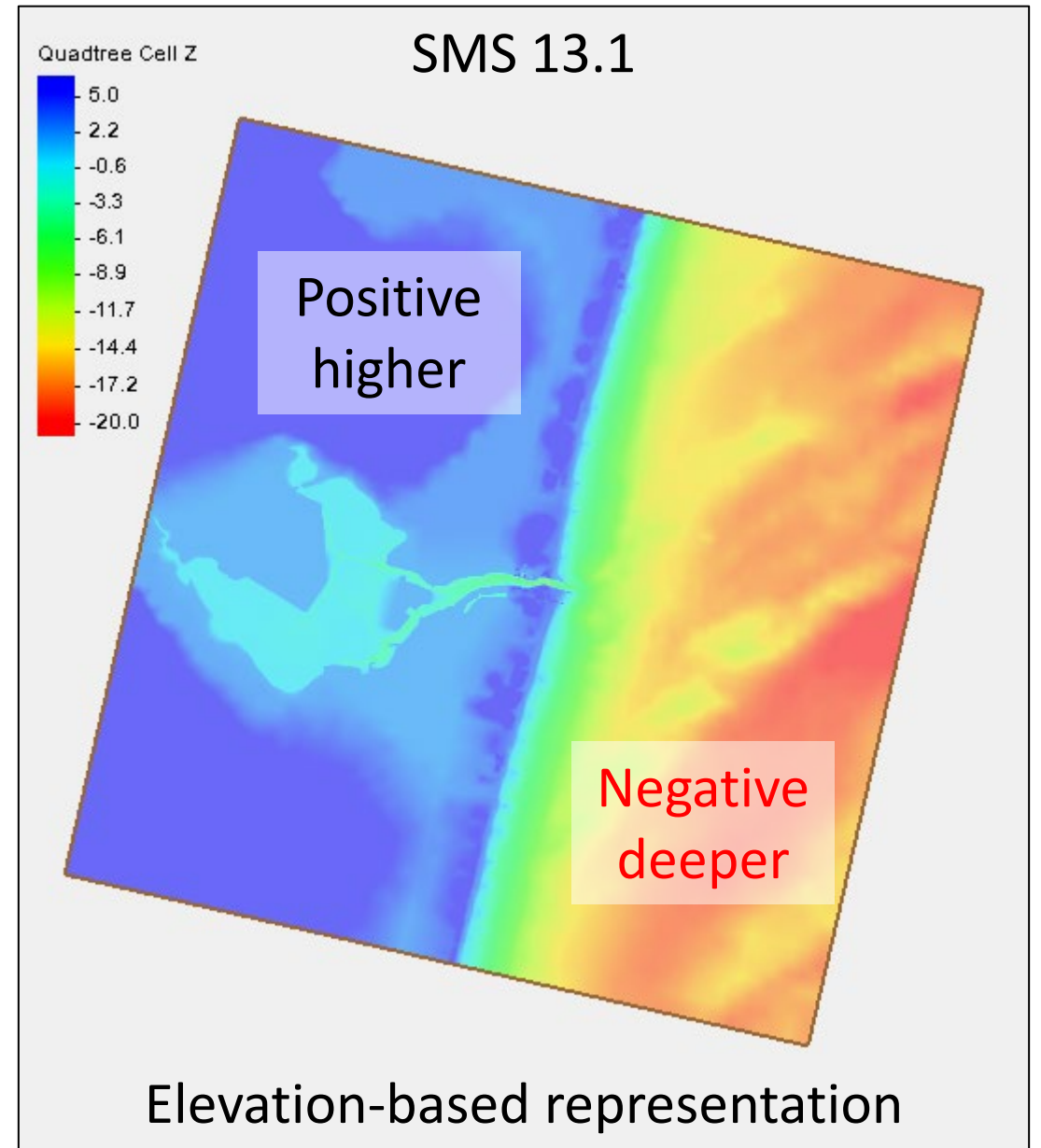
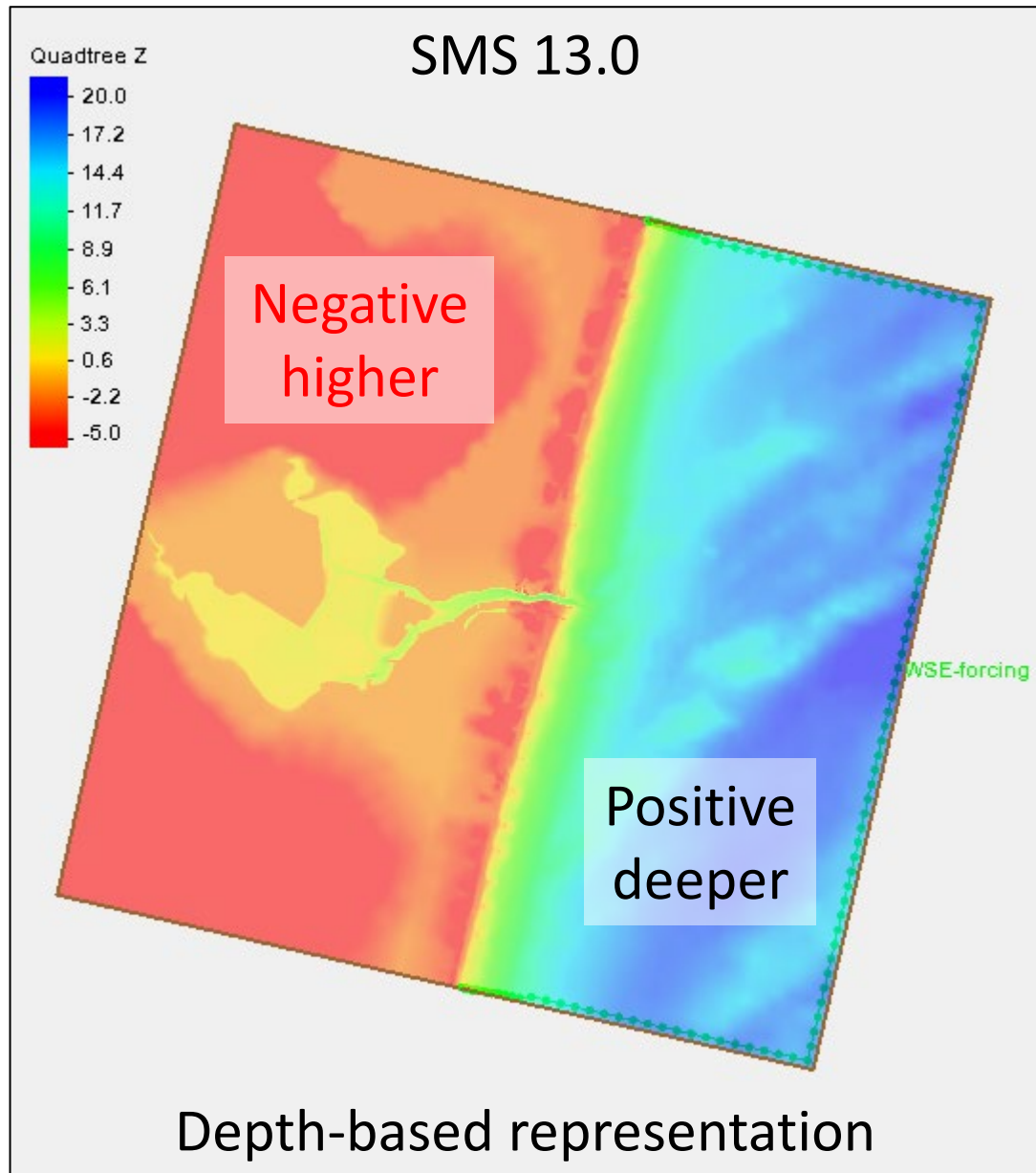
Next the datums must be modified so there is a common datum of the final scatter set.

This process is done through the data calculator.

Dataset	Horizontal Projection	Horizontal Units	Vertical Datum	Vertical Units	Convert to MSL (ft)	Convert to MSL (m)
0.75m_Contour.xyz	SP NJ	m	MSL	m	0	0
3364_0409_ft_MLW.xyz	SP NJ	ft	MLW	ft	2.25	0.686
Channel_Survey_NJ-DEP_0609_ft_MLW.xyz	SP NJ	ft	MLW	ft	2.25	0.686
Coastal_Relief_Model_II_m_msl.pts	Lat Long	degrees	MSL	m	0	0
Field_Team_Measurements_0809_m_NAVD.xyz	SP NJ	m	NAVD88	m	-0.246	-0.075
LIDAR_ft_NAVD.xyz	SP NJ	ft	NAVD88	ft	-0.246	-0.075



SMS changes from 13.0 to 13.1+



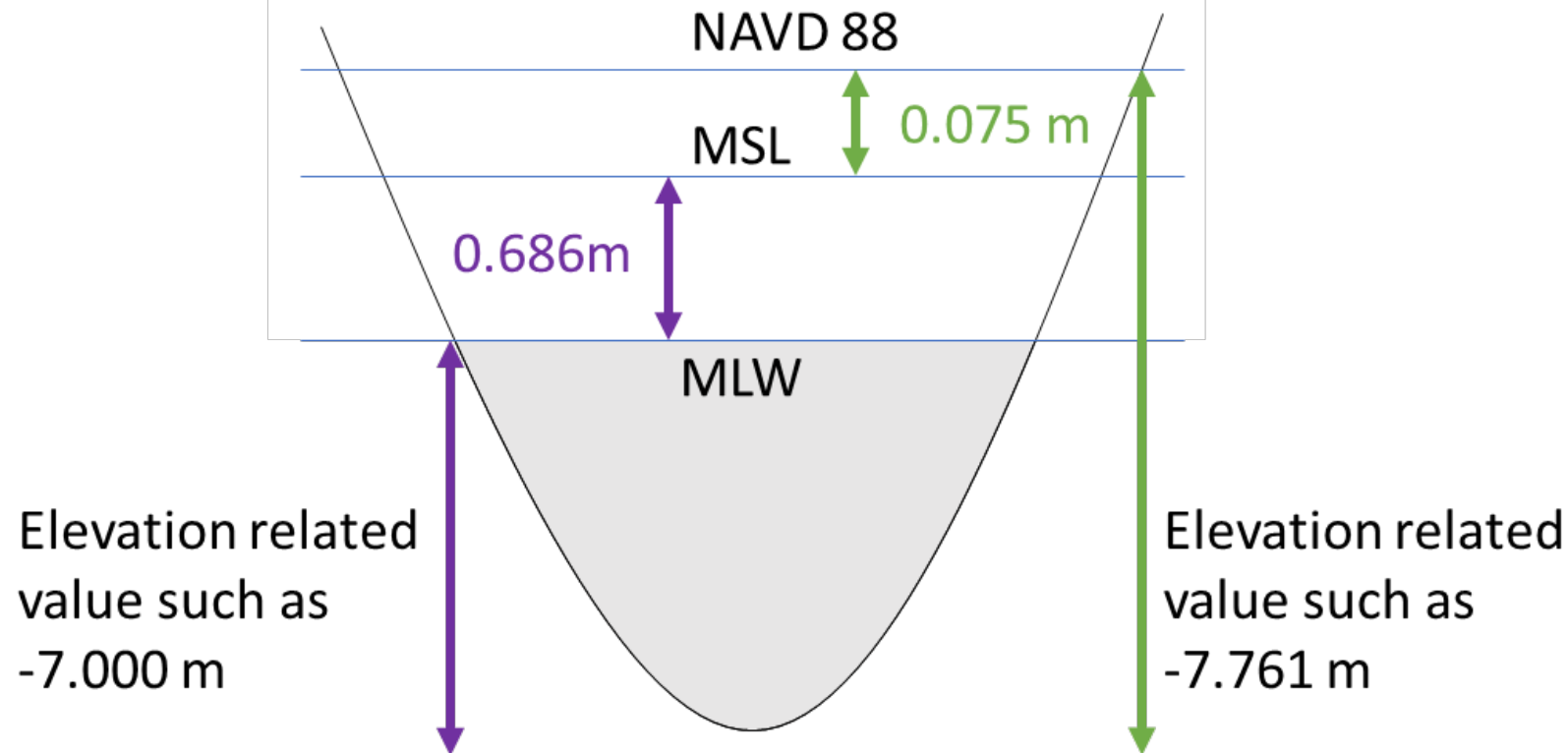
Because all these survey files are already Positive UP, no change to the sign is needed

0.75m_Contour.xyz	No change needed
3364_0409_ft_MLW.xyz	Convert feet to meters, MLW to MSL
Channel_Survey_NJ-DEP_0609_ft_MLW.xyz	Convert feet to meters, MLW to MSL
Coastal_Relief_Model_II_m_msl.pts	No change needed
Field_Team_Measurements_0809_m_NAVD.xyz	Convert NAVD 88 to MSL
LIDAR_ft_NAVD.xyz	Convert feet to meters, NAVD to MSL

Dataset	Horizontal Projection	Horizontal Units	Vertical Datum	Vertical Units	Convert to MSL (ft)	Convert to MSL (m)
0.75m_Contour.xyz	SP NJ	m	MSL	m		
3364_0409_ft_MLW.xyz	SP NJ	ft	MLW	ft	2.76	0.841
Channel_Survey_NJ-DEP_0609_ft_MLW.xyz	SP NJ	ft	MLW	ft	2.76	0.841
Coastal_Relief_Model_II_m_msl.pts	Lat Long	degrees	MSL	m		
Field_Team_Measurements_0809_m_NAVD.xyz	SP NJ	m	NAVD88	m	-0.246	-0.075
LIDAR_ft_NAVD.xyz	SP NJ	ft	NAVD88	ft	-0.246	-0.075

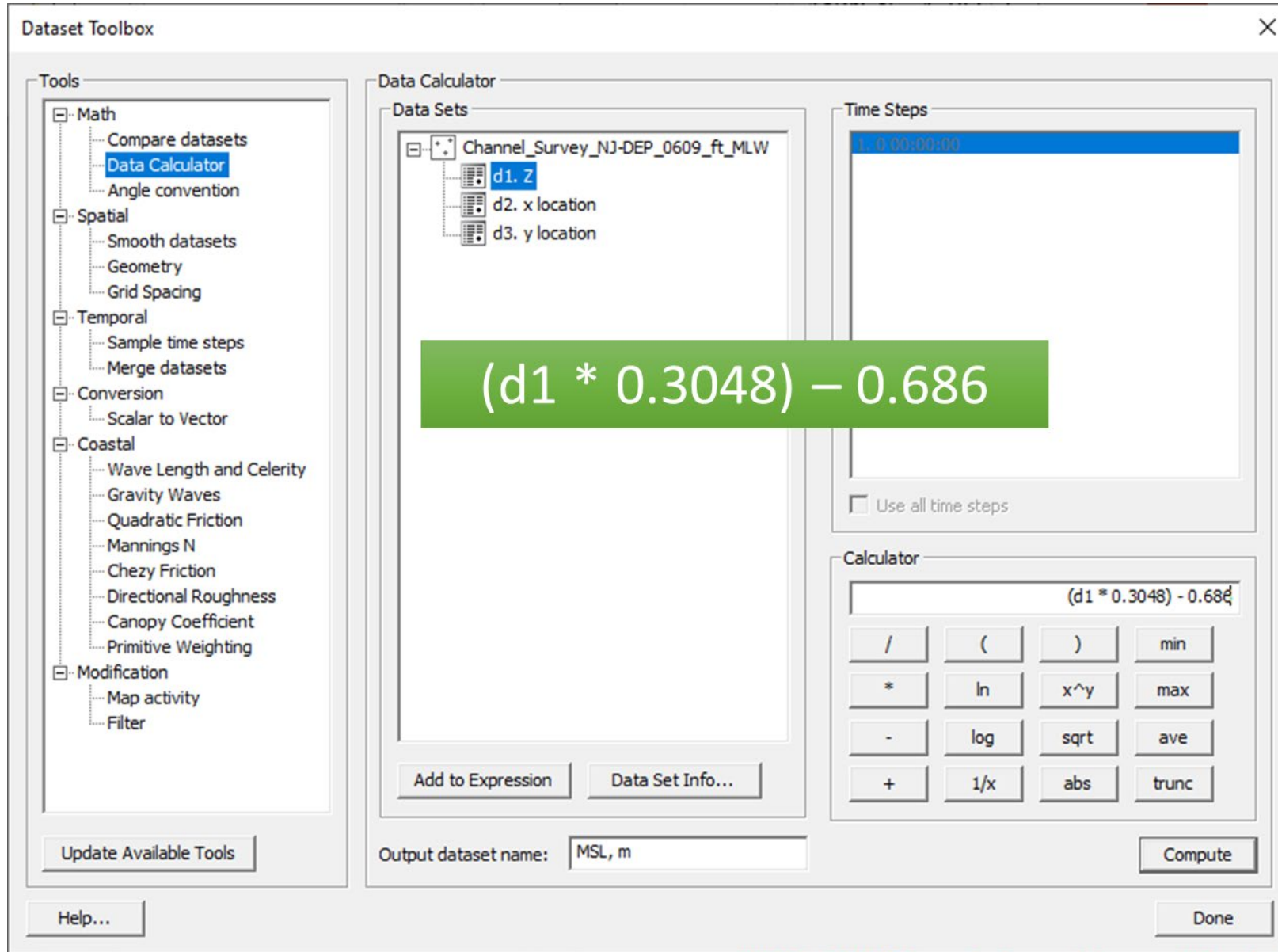
It can be confusing to determine whether to add or subtract the datum from the original values. The diagram below should help.

- Moving from the lower MLW to the higher MSL datum means the value must be deeper (more negative in this case). Working with elevations means we must **subtract** to get a more negative value.
- Moving from the higher NAVD88 to the lower MSL datum means the value must be shallower (less negative). We must **add** to get a less negative value.



- MLW to MSL = value – correction = $-7.000 - 0.686 = -7.686 \text{ m}$
- NAVD88 to MSL = value + correction = $-7.761 + 0.075 = -7.686 \text{ m}$

Example Datum conversion



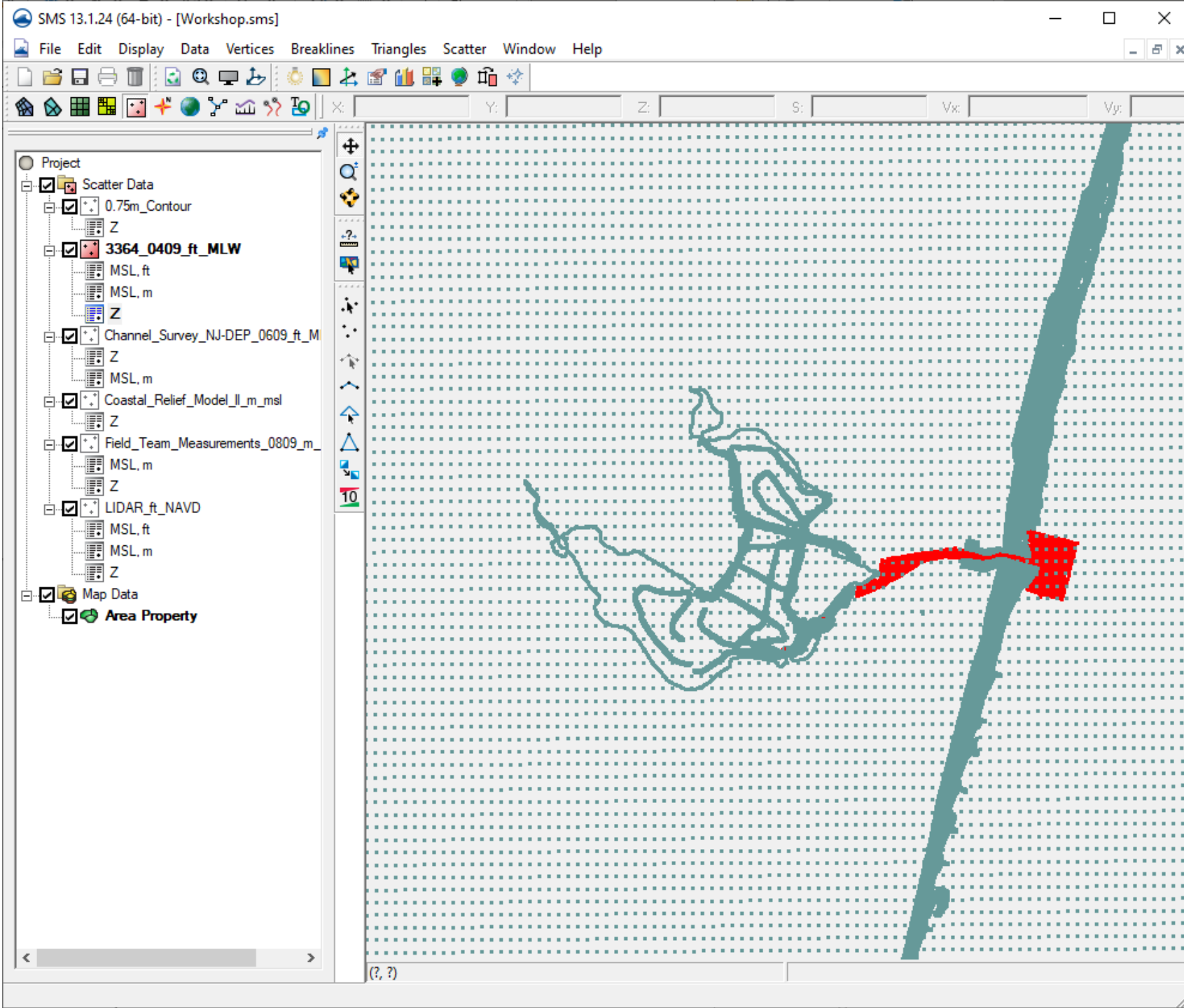
Channel Survey must have the following changes:

- 1) Convert feet to meters (multiply by 0.3048)
- 2) Add (or subtract) datum conversion (ex. from MLW to MSL, - 0.686)

They can be combined in one step or separated into separate steps.

I recommend separate until you are comfortable with this.

The combined (one-step) conversion is shown to the left.



Remember to save
project frequently.

There is no UNDO in
SMS

Merge all but Coastal Relief datasets together

File Edit Display Data Vertices Breaklines Triangles Scatter Web Window Help

Scatter Options...

Merge Sets

Assign Point Name

Interpolate to Mesh

Merge Scatter Sets

Select scatter sets to merge

Priority	Scatterset	Merge	Dataset
1	LIDAR_ft_NAVD	<input checked="" type="checkbox"/>	m MSL
2	Field_Team_Measurements...	<input checked="" type="checkbox"/>	m MSL
3	Coastal_Relief_Model_II_m...	<input type="checkbox"/>	m MSL
4	Channel_Survey_NJ-DEP_0...	<input checked="" type="checkbox"/>	m MSL
5	3364_0409_ft_MLW	<input checked="" type="checkbox"/>	m MSL
6	0.75m_Contour	<input checked="" type="checkbox"/>	m MSL

Select All Deselect All Move up Move down

Merged scatter set options

Name: Merged surveys

☒ Delete original scatter sets

Overlapping region options

☒ Merge all scatter points

☐ Delete lower priority scatter points

☒ Maintain triangulation

Help... OK Cancel

Merge Report

Input	vertices
Channel_Survey_NJ-DEP_0609_ft_MLW	2006
Field_Team_Measurements_0809_m_NAVD	176695
LIDAR_ft_NAVD	977751
0.75m_Contour	732
3364_0409_ft_MLW	5729
Output	
Merged surveys	1162877

Deleted Points

36 points deleted due to duplicate point tolerance.

Options Used

Input scattersets/functions

Channel_Survey_NJ-DEP_0609_ft_MLW/m MSL

Field_Team_Measurements_0809_m_NAVD/m MSL

LIDAR_ft_NAVD/m MSL

0.75m_Contour/POINT_Z

3364_0409_ft_MLW/m MSL

Merging all points

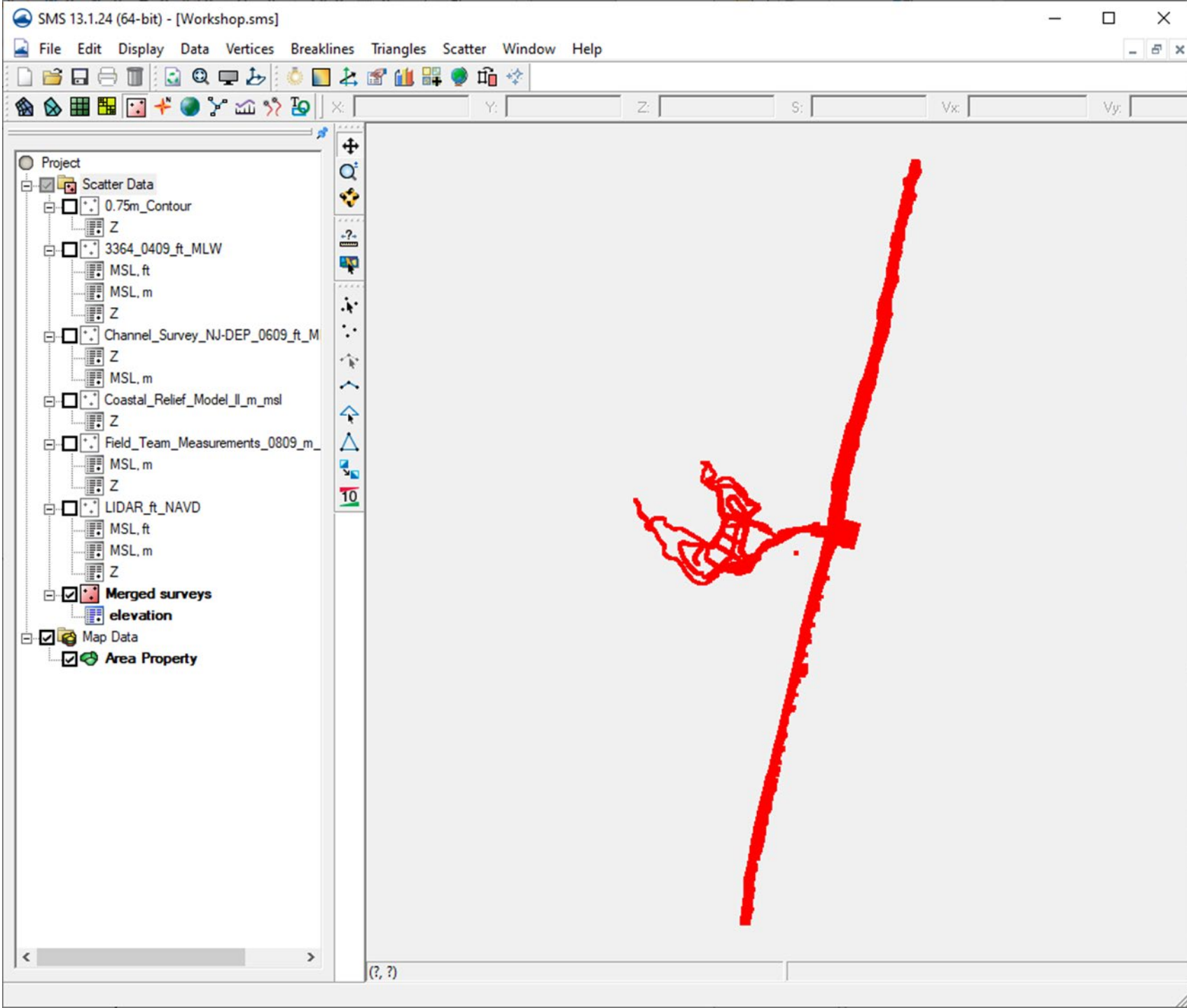
Duplicate point tolerance: 0.1

Help

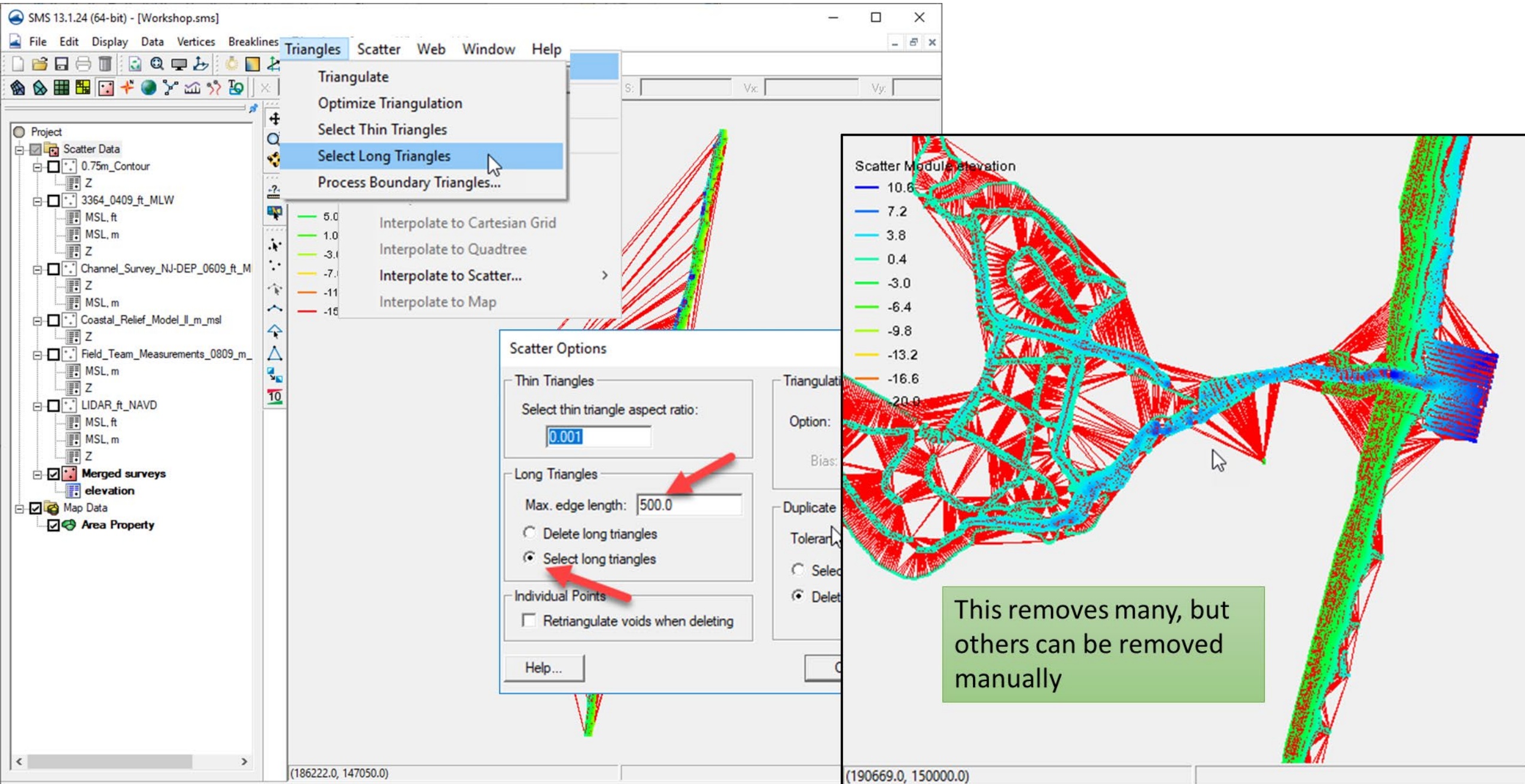
Scatter Data

- ☒ LIDAR_ft_NAVD
 - m MSL
 - m NAVD
 - points)
- ☒ Field_Team_Measurements_0809_m...
 - m MSL
 - points)
- ☒ Coastal_Relief_Model_II_m_msl
 - m MSL
 - points)
- ☒ Channel_Survey_NJ-DEP_0609_ft_M...
 - m MLW
 - m MSL
 - points)
- ☒ 3364_0409_ft_MLW
 - m MLW
 - m MSL
 - points)
- ☒ 0.75m_Contour
 - Z
 - m MSL
- ☒ **Merged surveys**
 - m MSL
- ☒ Map Data
- ☒ Area Property

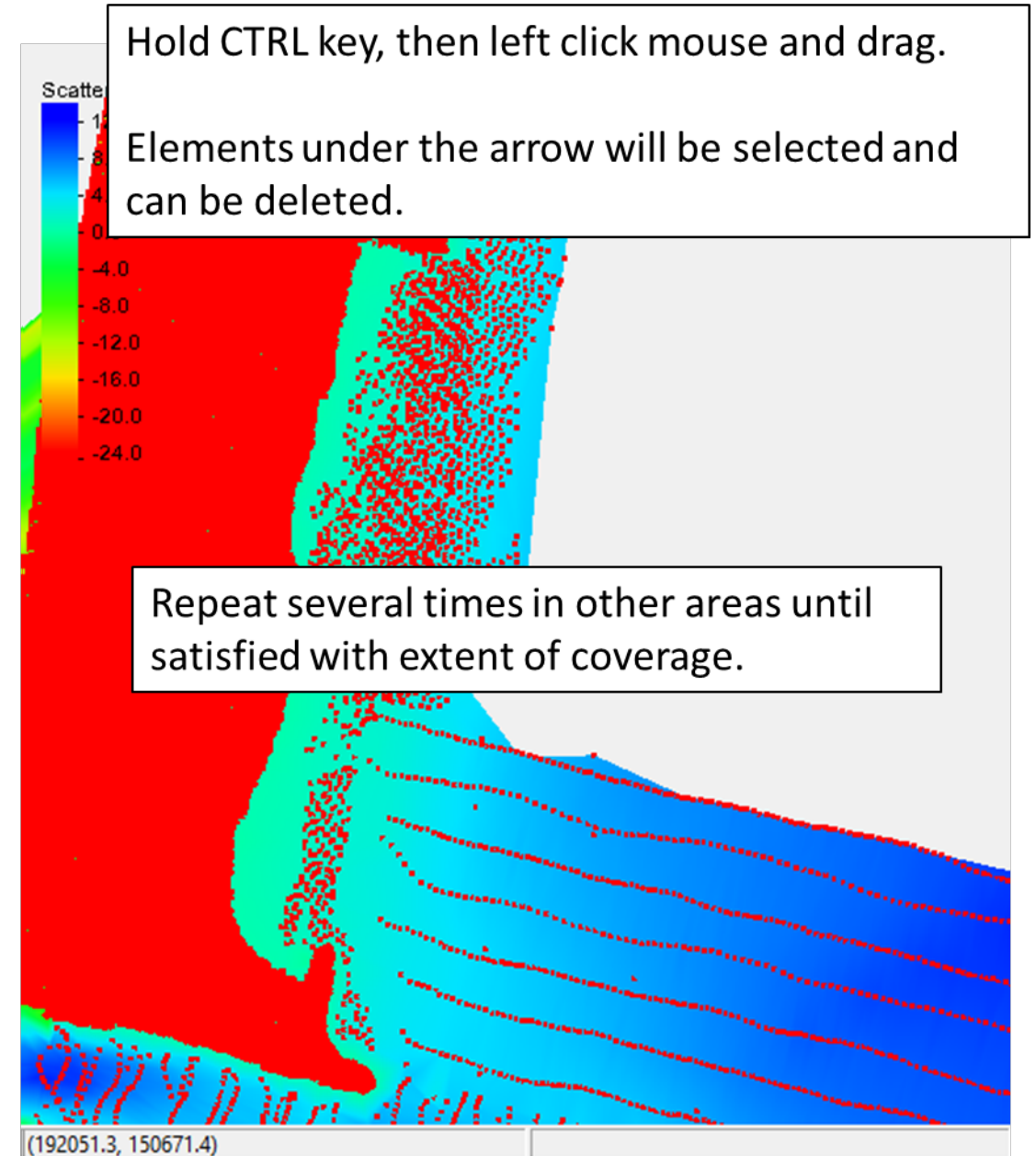
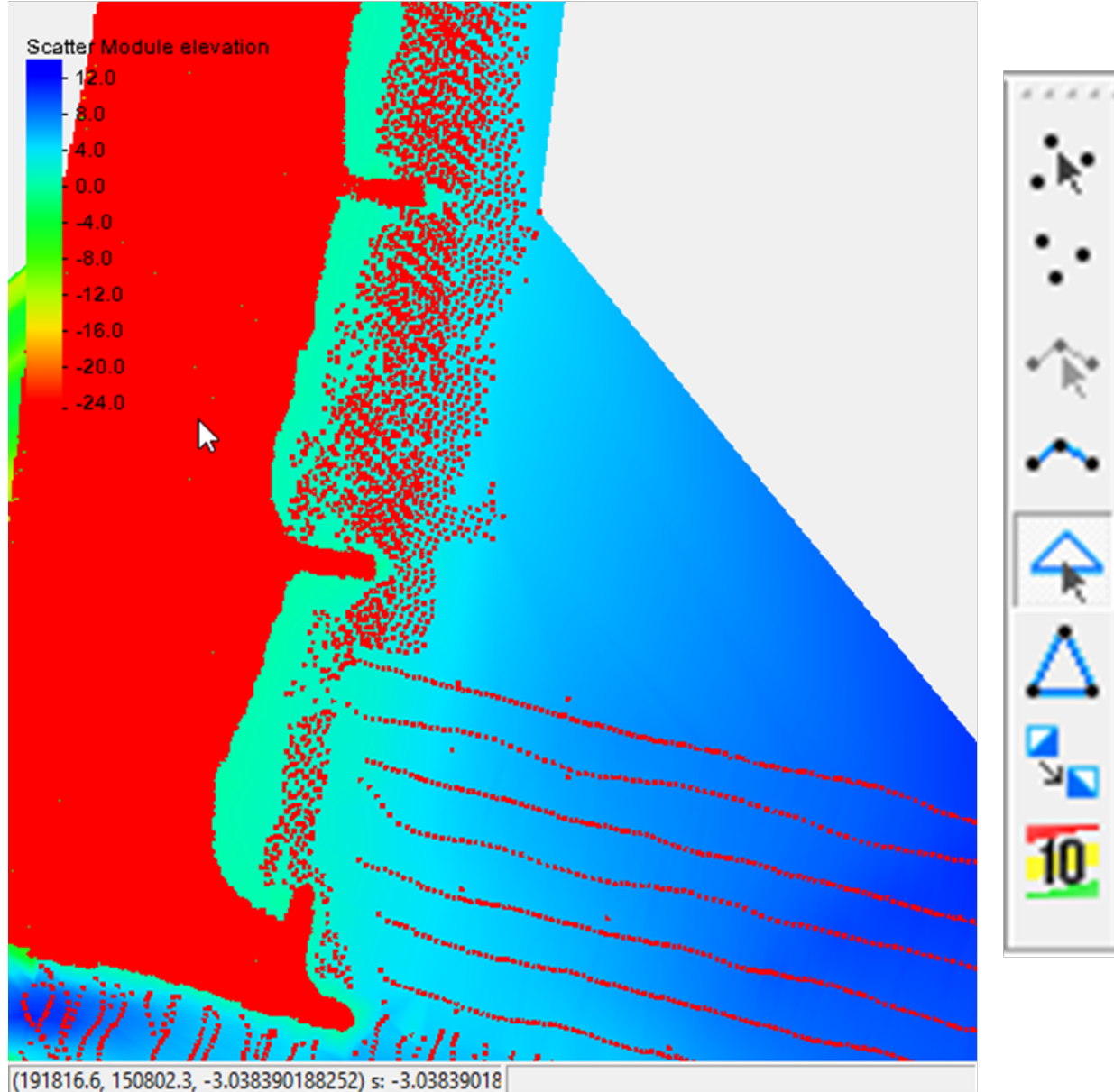
Merge two or more scatter sets.



Remove triangulated elements where no points exist



Manually remove elements before next merge of datasets



Merge this dataset with Coastal Relief dataset – WITH Priority to this one

