Working with Bathymetry

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







SMS 13.0.5 (64-bit) - [untitled.sms]	– 🗆 X
🚘 File Edit Display Data Vertices Breaklines Triangles Scatter Window Help	
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Plot Data Plot Display Options Plot Display Options Map Data Area Property Vertical	Filter strings: Add projection from: EPSG code .prj file Library Edited Parms Projection name: NAD 1983 StatePlane New Jersey FIPS 2900 (Meters)
Datum: Local Units: Meters Help OK Cancel	WKT: PROJCS["NAD_1983_StatePlane_New_Jersey_FIPS_2900",GEOGCS["GCS_North_American_198 3",DATUM["D_North_American_1983",SPHEROID["GRS_1980", 6378137.0,298.257222101]],PRIMEM["Greenwich",0.0],UNIT["Degree", 0.0174532925199433]],PROJECTION["Transverse_Mercator"],PARAMETER["False_Easting", 150000.0],PARAMETER["False_Northing", 0.0],PARAMETER["Central_Meridian",-74.5],PARAMETER["Scale_Factor", 0.9999],PARAMETER["Latitude_Of_Origin",38.8333333333333334],UNIT["Meter", 1.0],AUTHORITY["EPSG",32111]]
	Help OK Cancel
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₽₽₽	View	>		AD 1983 (2011) StatePlane A	A NAD 1983 (2011) StatePlane North Carolina FIPS 3200 (M	eters) *
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Z Rename ⊡-⊡Z *. Field_Te Split	Projection name: NAD 1983 (2011) StatePlane New Jersey FIPS 2900 (US Feet)	Go thr
Generate Contour Breaklines Interpolate to Convert Interpolate to Convert Map Data Metadata Com to Scatter Properties	WKT: PROJCS ["NAD_1983_2011_StatePlane_New_Jersey_FIPS_2900_Ft_US",GEOGCS ["GCS_NAD_1983_2011",DATUM["D_NAD_1983_2011",SPHEROID ["GRS_1980",6378137.0,298.257222101]],PRIMEM["Greenwich",0.0],UNIT ["Degree",0.0174532925199433]],PROJECTION ["Transverse_Mercator"],PARAMETER Vertical Datum: Local Units: Feet (U.S. Survey) Help OK Cancel	the pr preser record As the display in our

Go through each dataset and set the projection to the system it is presently in according to our records (next slide).

As the projections are set, the display will alter showing them in our desired Display Projection.

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	2.76	0.841
Channel_Survey_NJ-DEP_0609_ft_MLW.xyz	SP NJ	ft	MLW	ft	2.76	0.841
Coastal_Relief_Model_ll_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

COE NAN Benchmarks		
	1	NAVD 88
0.246 ft (0.075 m)	1	MSL
NAN used their own trusted conversion for MLW to NAVD88 to figure out the MLW to MSL conversion.	1.1 ft (0.335 m)	NGVD 29
MLW to NAVD88 = 1.9 + 1.1 = 3.0 ft NAVD88 to MSL = .246 ft	1.9 ft (0.579 m)	
MLW to MSL = 3.0246 = 2.76 ft	↓	MLW
		MLLW



SMS 13.0.5 (64-bit) - [untitled.sms]						
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Project □ □ □ □ 3364_0409_ft_MLW □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □						

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.

Depending on the order the surveys were brought in, the default scalar dataset can have varying names (ie, POINT_Z, elevation, z, etc) 0.75m_Contour.xyzElevations to Depths, No other change needed3364_0409_ft_MLW.xyzElevations to Depths, Convert feet to meters, MLW to MSLChannel_Survey_NJ-DEP_0609_ft_MLW.xyzElevations to Depths, Convert feet to meters, MLW to MSLCoastal_Relief_Model_II_m_msl.ptsElevations to Depths, No other change neededField_Team_Measurements_0809_m_NAVD.xyzElevations to Depths, Convert NAVD to MSLLIDAR_ft_NAVD.xyzElevations to Depths, 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		
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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

Example Datum conversion

Dataset Toolbox			×	
Dataset Toolbox Tools Tools Data Calculator Angle convention Spatial Smooth datasets Geometry Grid Spacing Temporal Sample time steps Merge datasets Conversion Scalar to Vector Coastal Wave Length and Celerity Gravity Waves	Data Calculator Data Sets Channel_Survey_NJ-DEP_0609_ft_MLW d1. POINT_Z d2. x location d3. y location	Time Steps		
Map activity Filter	(-d1 * 0.3048) -	- 0.686	(-d1*.3048)+0,686	
Update Available Tools	Add to Expression Data Set Info Output dataset name: new dataset	/ (* In - log + 1/x) min x^y max sqrt ave abs trunc Compute	
Help			Done	

Channel Survey must have the following changes:

- 1) Flip sign (elevation to depths)
- 2) Convert feet to meters (multiply by 0.3048)
- 3) 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.







Remove triangulated elements where no points exist



Manually remove elements before next merge of datasets



Hold CTRL key, then left click mouse and drag. Scatte Elements under the arrow will be selected and can be deleted. -12.016.0 -24.0 Repeat several times in other areas until satisfied with extent of coverage.

(192051.3, 150671.4)

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



