



# Geoid18 Verification in Carlson SurvCE

Date: 10 December 2019

By: Mark Silver, [ms@igage.com](mailto:ms@igage.com)

## Thesis

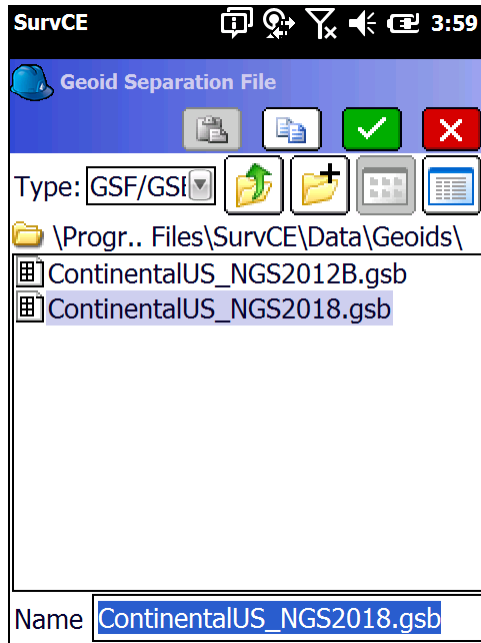
There is a possibility of having an incorrect GEOID 18 implementation in every product because of an NGS format translation issue.

A grid of known good/bad points was provided by NGS:

	Latitude		Longitude				CORRECT GEOID18 Height	CORRECT GEOID18 Height (Feet)	INCORRECT GEOID18 Height	INCORRECT GEOID18 Height (Feet)
	Deg.	Min.	Deg.	Min.						
Grid 1	45	13	122	46			<b>-23.076</b>	<b>-75.709</b>	-23.107	<b>-75.810</b>
Grid 2	48	7	96	11			<b>-27.215</b>	<b>-89.288</b>	-27.247	<b>-89.393</b>
Grid 3	44	30	94	3			<b>-28.072</b>	<b>-92.100</b>	-28.103	<b>-92.201</b>
Grid 4	41	34	72	39			<b>-29.591</b>	<b>-97.083</b>	-29.622	<b>-97.185</b>
<b>Grid 5</b>	<b>39</b>	<b>32</b>	<b>121</b>	<b>29</b>			<b>-27.337</b>	<b>-89.688</b>	<b>-27.369</b>	<b>-89.793</b>
Grid 6	33	5	97	1			<b>-26.955</b>	<b>-88.435</b>	-26.986	<b>-88.537</b>
Grid 7	36	15	82	46			<b>-31.341</b>	<b>-102.825</b>	-31.372	<b>-102.927</b>
Grid 8	38	19	17	19			<b>-32.636</b>	<b>-107.073</b>	-32.699	<b>-107.280</b>
PR Grid 0	18	27	67	24			<b>-45.673</b>	<b>-149.846</b>	-45.735	<b>-150.049</b>

## How can we verify a GEOID in Carlson SurvCE?

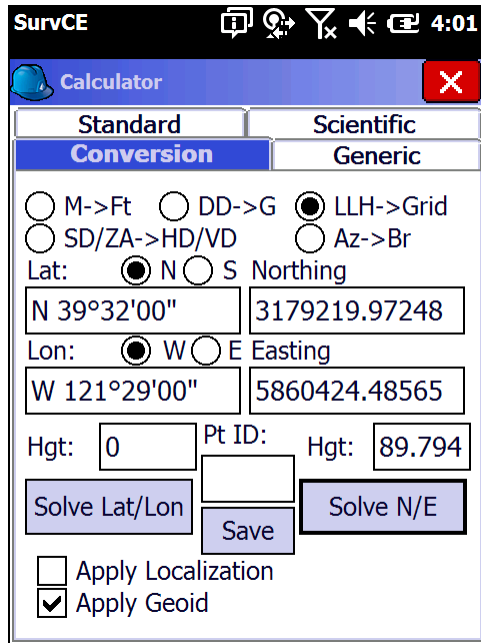
Make sure GEOID18 is selected ( Equip: 6 Localization: GPS (tab): Geoid File (button)):



GEOID18 is selected if as shown above.

From the SurvCE calculator screen ( COGO: 8 Calculator: Conversion (tab): LLH -> Grid ) you can enter a test Lat/Lon pair from above, with the correct GEOID separation, then compute the height offset.

For example GRID 5:



The screenshot shows the SurvCE Calculator application in the 'Conversion' tab. The 'Standard' sub-tab is selected, and the 'Generic' conversion type is chosen. The settings are as follows:

- Conversion type:  M->Ft,  DD->G,  LLH->Grid
- Other options:  SD/ZA->HD/VD,  Az->Br
- Latitude:  N,  S Northing
- Longitude:  W,  E Easting
- Height (Hgt): 0
- Point ID (Pt ID): [empty]
- Height (Hgt): 89.794
- Buttons: Solve Lat/Lon, Save, Solve N/E
- Checkboxes:  Apply Localization,  Apply Geoid

The results displayed are:

N 39°32'00"	3179219.97248
W 121°29'00"	5860424.48565

The Carlson GEOID is **incorrect** as the displayed GEOID Height is incorrect.