

To complete our systematic analysis, our last demonstration uses NAD 1983 (2011), a 7 parameter WGS84-to-NAD83(2011) transformation for export.

A. Settings

- Copied N1-N7 project folders (“N” for null) to C1-C7 (“C” for Copy)
- All .cor files exported with 7-parameter WGS84-to-NAD83(2011) transformation

Note, one could argue these should be exported with NAD83(CORS96) but for the sake of our systematic

analysis, choose NAD1983 (2011) for all exports”

- Resulting .shp files assigned UTM NAD83 projection files (.prj)

#	Choose Ref Position Source	Distance from base	Resulting .cor file	Choose Ref System and Transformation	Assign .prj file & Resulting.sh
C1	1 st Option RINEX header	n/a	ITRF00	Lat/Long ITRF00 NAD 1983 (2011)	UTM 11N NAD83.prj
<i>* In Demo # 1, we learned this was really NAD83 but for the sake of consistency, choose ITRF00</i>					
C2	2 nd Option CBS-Populated	1.23 m	“HTDP-ITRF00”	Lat/Long ITRF00 NAD 1983 (2011)	UTM 11N NAD83.prj
<i>* See Demo # 1 Conclusion for an explanation of the term “HTDP-ITRF00”</i>					
C3	Seed NGS “New” L1	1.34 m	IGS08	Lat/Long ITRF00 NAD 1983 (2011)	UTM 11N NAD83.prj
C4	Seed NGS “New” L1	0.05 m	NAD83 (2011)	UTM NAD83 NAD 1983 (2011)	UTM 11N NAD83.prj
C5	Seed NGS “Old” L1	1.23 m	ITRF00	Lat/Long ITRF00 NAD 1983 (2011)	UTM 11N NAD83.prj
C6	Seed NGS “Old” L1	0.0 m	NAD83 (CORS96)	UTM NAD83 NAD 1983 (2011)	UTM 11 N NAD83.prj
C7	Seed NGS “Old” ARP	0.0 m	ITRF00	Lat/Long ITRF00 NAD 1983 (2011)	UTM 11N NAD83.prj

Export: Choose Reference System and Transformation

- Lat/Long - ITRF00 or UTM - NAD83 as shown in chart
- NAD 1983 (2011) transformation for all. Since N4 and N6 are already NAD83. Choosing a 7-parameter transformation shifts these locations twice –

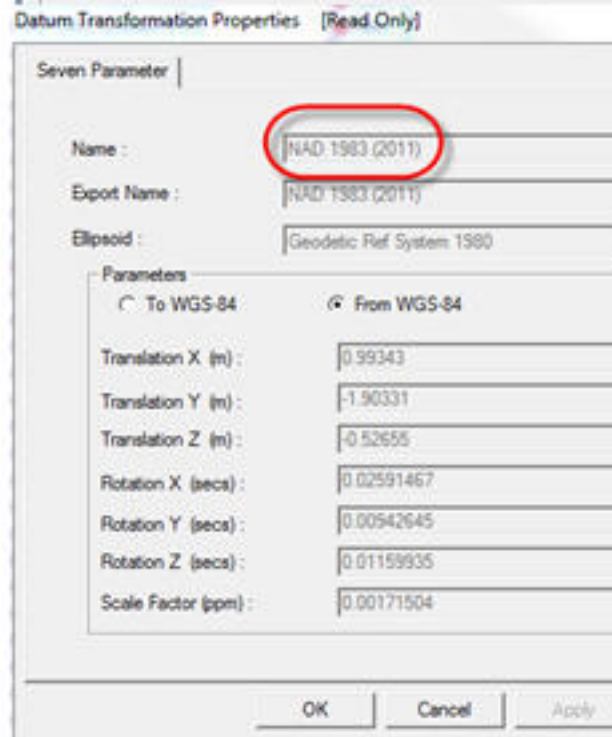
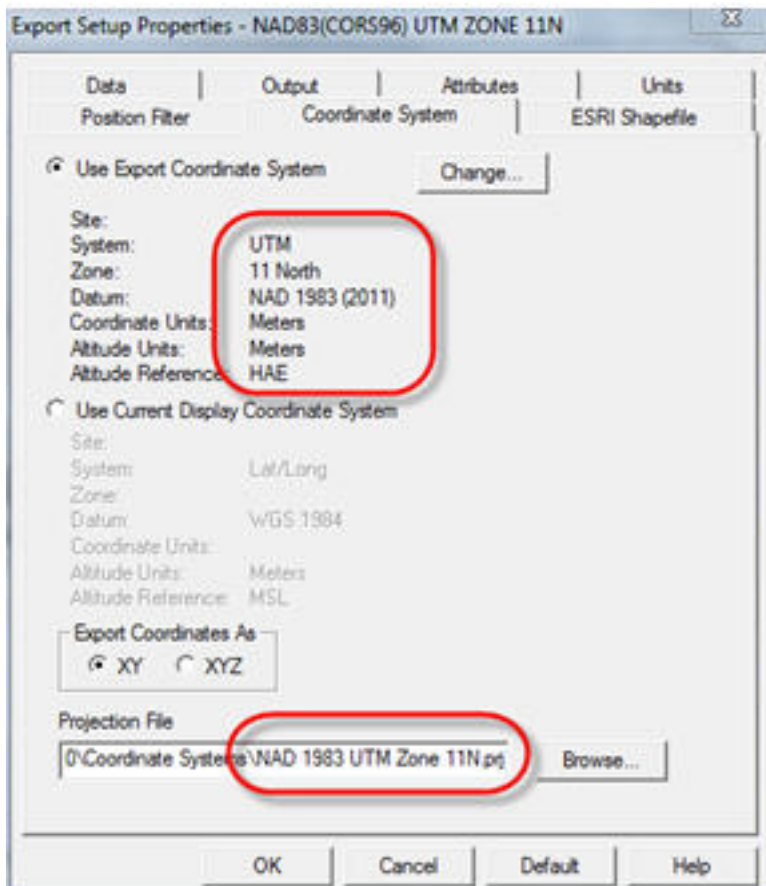
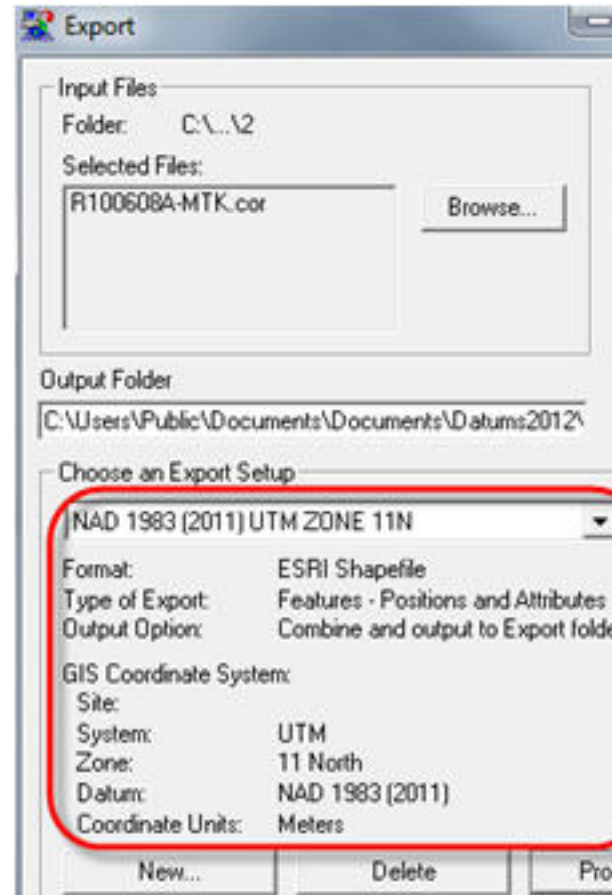
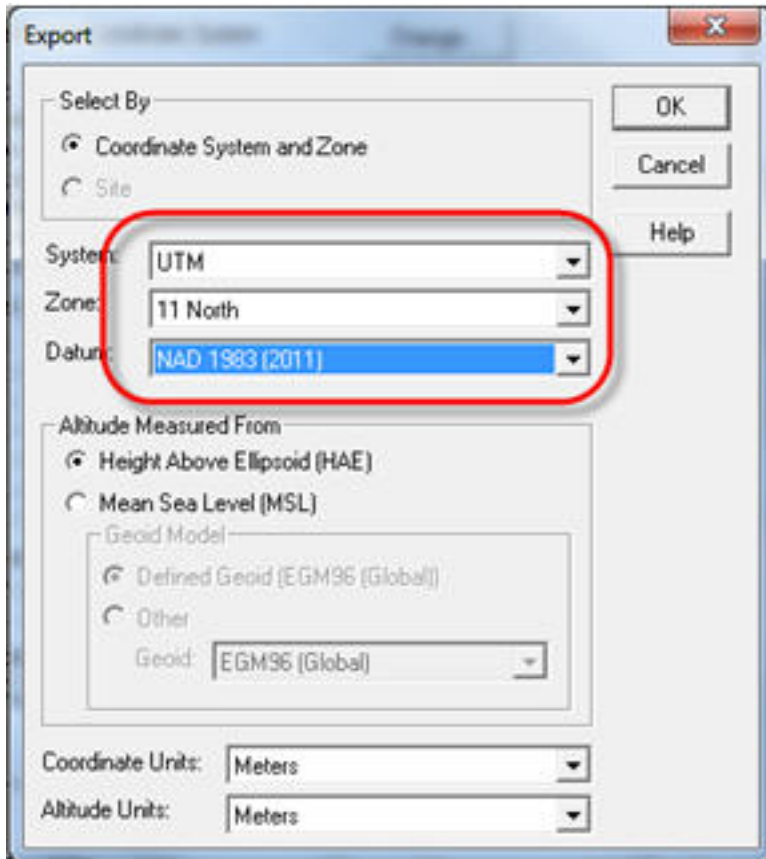
i.e. once while differentially correcting from the NAD83 base station coordinates, and again via the WGS84-to-NAD83 transformation. This is ok for now since we are systematically applying the transformations to **all** data to watch the results.

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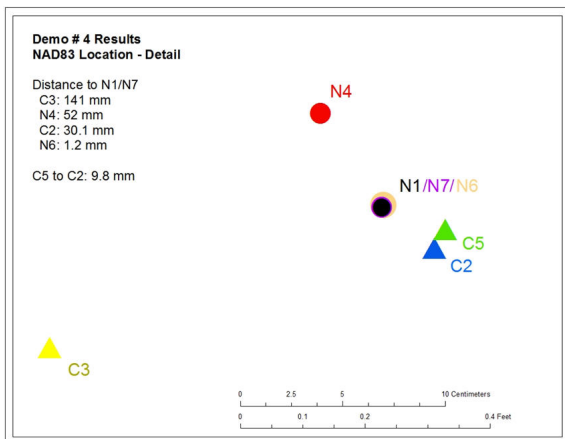
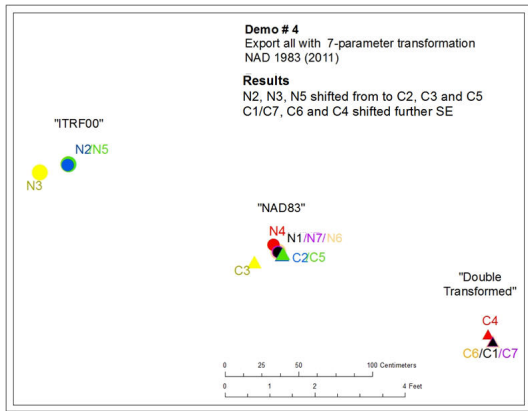
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Demo # 4: Export with 7-parameter WGS84 - NAD83 transformation



Transformation Manager / Transformations tab / 7-parameter

B. View results in ArcMap



C. Analysis

The 3 groupings are as expected based on the “meters from base”.

C2/C3/C5

The previous “ITRF00” locations, have shifted 1.23 m southeast to the NAD83 location when exported with the NAD 1983(2011) transformation

- C2 shifted from “HTDP-ITRF00” to NAD83(2011)
- C3 shifted from IGS08 to NAD83(2011)
- C5 shifted from ITRF00 to NAD83(2011)

C1/C7 and C4/C6

These 4 locations have all shifted southeast to the new location when exported with the NAD 1983(2011) transformation. Corrected positions in the .cor files were NAD83; they took on this reference when differentially corrected against NAD83 base station. During export, the NAD 1983(2011) transformation was applied a second time. While this double transformation is a common error that is easily made by many, it should be avoided.

D. Conclusions

Not recommended

- C1/C7/C4/C6 can be dismissed since the resulting locations are due to applying an ITRF-to-NAD83 transformation twice as discussed above.
- C2 is definitely not recommended since “HTDP-ITRF00” introduces an unpredictable,

location-dependent IGS08-ITRF08 shift discussed in demo # 2.

- C5 is not recommended since it relies on “Old” coordinates based on the relative antenna position. NGS no longer supports or updates these positions since NA2011 released a new standard, the absolute antenna position.

“Best options”

C3 and N4 are the “best options” in light of the NA2011 and recent PFO changes but they are still not the “right way”. Consider these “temporary” work-arounds until a true solution can be found. A desired solution is suggested at the end of this series of pages.