

# Non-WGS 84 Datums in ESRI® ArcGIS® for Windows Mobile and Trimble® Positions™

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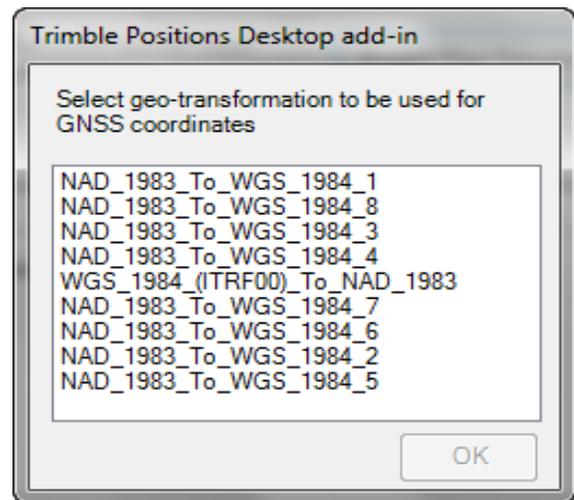
It has long been assumed that GNSS data collected with a Trimble Mapping system is always referenced to WGS 84. It is absolutely true that the GNSS coordinates calculated by the receiver are always referenced to WGS 84. However, the data that is collected by software such as ArcGIS for Windows Mobile can actually be referenced to a different spatial reference. The following steps will show you how to configure Windows Mobile to use NAD 83 or other projected coordinate systems.

## Desktop Setup

ESRI's ArcGIS for Windows Mobile software records data in a mobile cache that can be referenced to a limited number of projected coordinate systems and datums. The spatial reference of this mobile cache is set according to the spatial reference of the Data Frame in the MXD when the cache is created.

**Note: Setting the Mobile Cache to use any coordinate system other than WGS 1984 can cause low memory errors on the handheld device due to the RAM required to transform coordinates in real-time. It is highly recommended you set your Data Frame Properties to a WGS 84 datum no matter the spatial reference of your layers. This way, the transformation will be handled by ArcMap and not ArcGIS for Windows Mobile saving valuable RAM on the handheld.**

If you are using the Trimble Positions Desktop add-in, and have your data frame set to something other than WGS 84, you will be asked for a datum transformation when you Enable the Map Document under GNSS Enabling. The best choice for NAD 83 datums in the Continental US is the NAD\_1983\_To\_WGS\_1984\_5 transformation.



## Real-time Field Configuration setup:

Trimble Positions software always assumes calculated GNSS positions have been collected in the WGS84 datum. If you are using a real-time source that uses a different datum, you will need to specify this when you set up your Field Configuration to ensure the data is handled properly by Trimble Positions. Again, for NAD 1983 datums, the \_5 transformation is likely your best choice

Now you can continue to create the Mobile Cache.

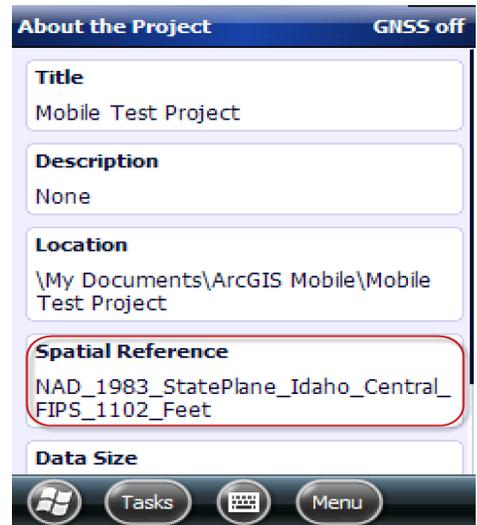
For more information about which datum transformation to use, please see ESRI's support note <http://support.esri.com/en/knowledgebase/techarticles/detail/24159>



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Once you have transferred the mobile cache and mobile project to your GPS device, you can check that the coordinate system is correct by opening your project in Window Mobile. On the Task List page click Menu> About Project. From there you will see the Spatial Reference of your Project.



## Trimble Positions Desktop add-in

### Post-processed Differential Correction (Processing Profile)

When you are creating a processing profile, you have the choice between 'Using a single base station' or 'Using a folder or specific base files.'

When using a single base station, all reference positions contained in Trimble's base station list have been put in terms of ITRF00 (essentially WGS 84 (G1150)). The reliability of the assumption that all of these reference positions are in terms of ITRF00 depends upon the coordinate supplied by the base provider; and if the reference position was originally referenced to a NAD 83 realization, whether the correct realization could be determined when converting to ITRF00. Particularly with CORS stations, data sheets exist that document clearly which NAD 83 realization the reference position is referenced to, whereas with private base stations, that is not always so easily determined. This could introduce positional errors. For example, if a base station reference position were actually referenced to NAD 83 (1986) but it was assumed that it was referenced to NAD 83 (CORS96) when the reference position contained in Trimble's base station list was converted to ITRF00, there could be 1 meter horizontal errors introduced by what amounts to an 'incorrect' reference position. In the case of non-CORS stations, there may be confusion regarding what that spatial reference is. In reality, it could be WGS 84 or any realization of NAD 83. This could cause positional errors, since the input datum may not be known accurately.

Using a folder or specific base files will give the options to 'Use reference positions from base files' or 'Use reference positions from base stations'. The 'Use reference position from base files' will use whatever reference position is supplied by the base station operator in whatever datum it has been established. In the case of CORS stations, that would be NAD 83 (CORS96) (2002.00 or 2003.00 epoch), NAD83 (PACP00), or NAD83 (MARP00). Therefore, if this option is selected, GPS data will actually be transformed to the datum of the base station reference position, in this case NAD 83 (CORS96), NAD83 (PACP00), or NAD83 (MARP00). The 'Use reference position from base files' option will transform data to whatever spatial reference is used by the base station reference position.