High Accuracy Data Collection with R10 and Field Maps

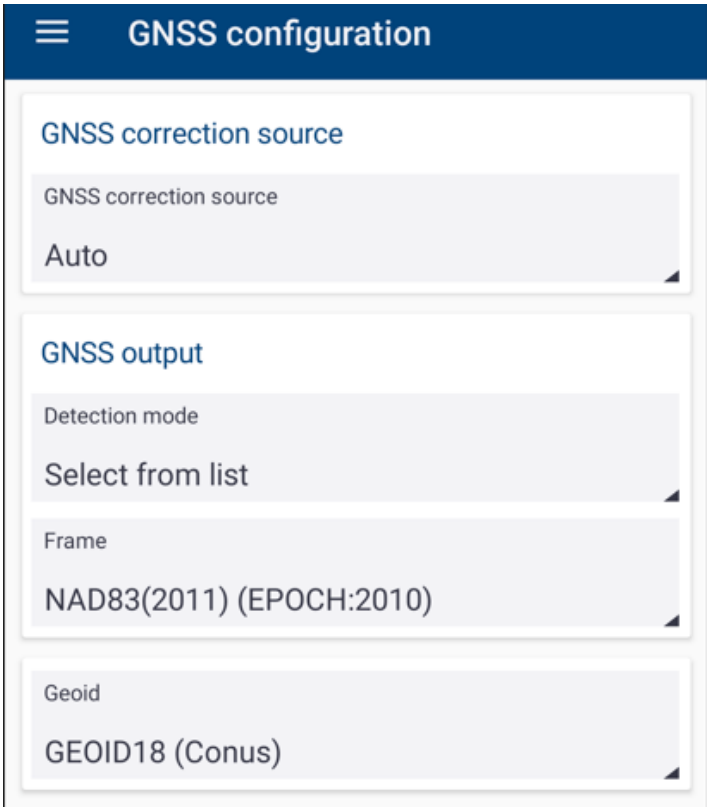
Project Goals

- Connect Trimble R10 to a mobile device.
- Integrate data collection with Field Maps and ArcGIS Online.
- Automate postprocessing ellipsoid to orthometric heights and generate a point feature for analysis.

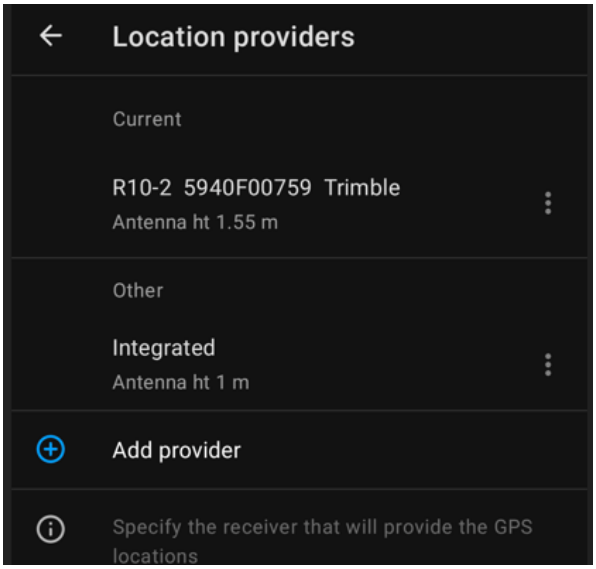
Peter Curtis, FRCC GIS Survey II instructor, requested a system to make data collection with the R10 efficient and integrated with ArcGIS Online. Students must collect survey-grade data using only a mobile device and the Trimble R10. Because Field Maps only records ellipsoid heights, an automated system is required to transform ellipsoid heights into orthometric heights.

Connect Trimble R10

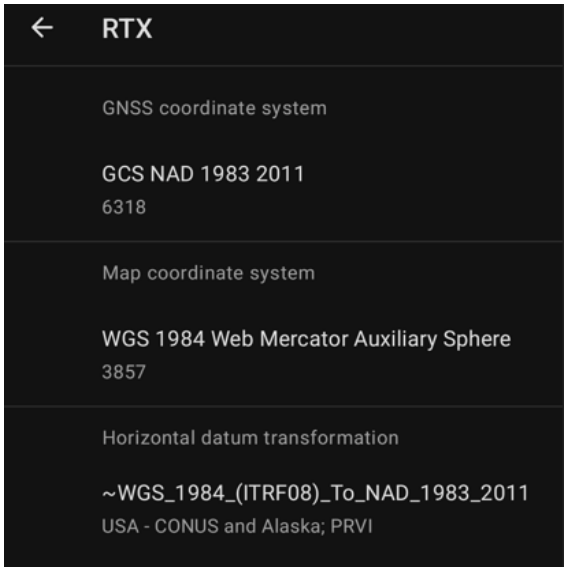
- Install Trimble Mobile Manager to connect R10 to mobile devices
- Pair R10 with a mobile device via Bluetooth.
- Configuring Trimble RTX For Use With Collector for ArcGIS https://youtu.be/pP48F0QlXRA



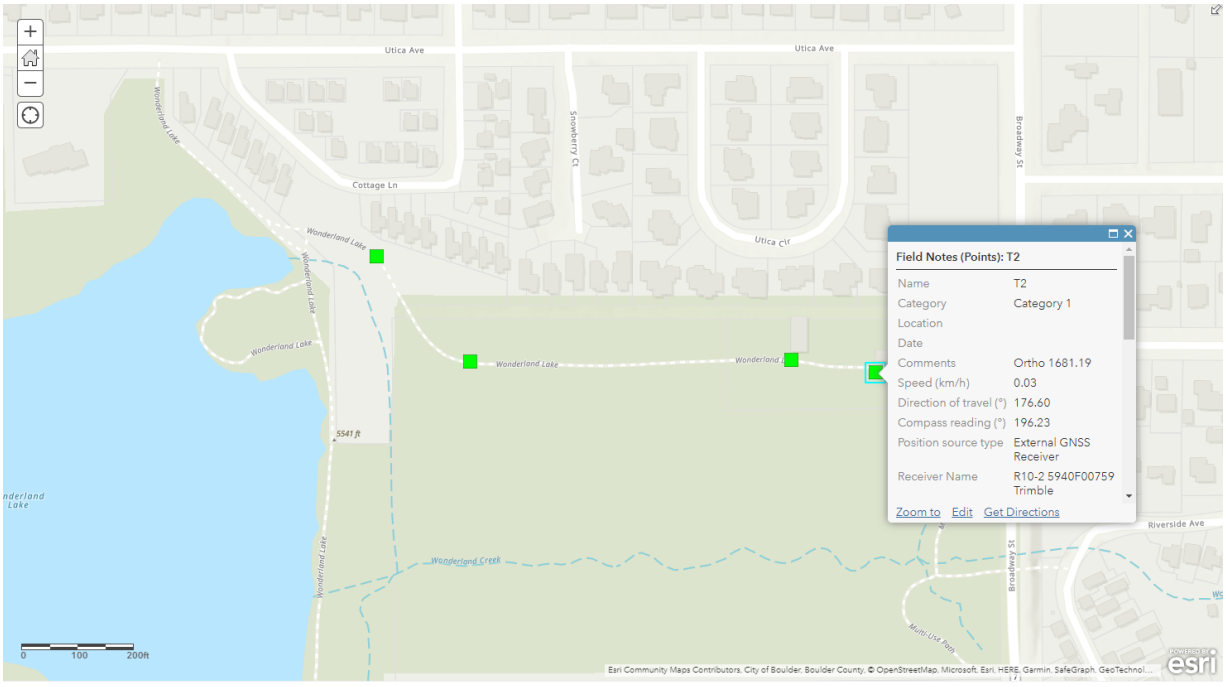
Integrate with Field Maps



Configure R10 as Location Provider



Configure Location Profile from Mobile Manager Settings



Create a Feature layer and Web Map in ArcGIS Online

Collect data in Field Maps

Automate Postprocessing

https://github.com/jamesjahraus/R10FieldMaps

Data and Services

0.5-meter resolution DEM derived from LiDAR data downloaded from Colorado Hazard Mapping.
https://coloradohazardmapping.com/lidarDownload

Compute a GEOID18 geoid height for a single location
https://geodesy.noaa.gov/GEOID/GEOID18/computation.html

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DESIGNATION -  Z 321
PID         -  LL0698
STATE/COUNTY-  CO/BOULDER
COUNTRY     -  US
USGS QUAD   -  BOULDER (2019)

                    *CURRENT SURVEY CONTROL
______________________________________________________________________
NAD 83(1986) POSITION- 40 03 02.7    (N) 105 16 55.1    (W)   HD_HELD2
NAVD 88 ORTHO HEIGHT -  1677.529 (meters)     5503.69  (feet) ADJUSTED
______________________________________________________________________
GEOID HEIGHT    -        -15.560 (meters)                     GEOID18
DYNAMIC HEIGHT  -       1675.891 (meters)     5498.32  (feet) COMP
MODELED GRAVITY -    979,591.6   (mgal)                       NAVD 88

VERT ORDER      -  FIRST     CLASS II
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https://www.ngs.noaa.gov/cgi-bin/ds_mark.prl?PidBox=LL0698