

## Creating the maps:

The lines depicting The Continental Divide Trail in this book are actually GPS recordings collected by a field crew during the summers of 2009-2011 and maintained since to reflect changes. The GPS gear consists of two professional grade Ashtech receivers with sub-meter or better accuracies. The receivers are allowed to run continuously, with positions collected systematically while hiking. Whenever features such as intersections, roads, creeks, etc. are encountered the GPS is held stationary for a period of time to enhance accuracy. The data is differentially corrected, either by satellite based augmentation (SBAS) or post-processing to improve accuracy. More than 5.2 million points were recorded over about 3,047 miles of trail then thinned to favor accuracy based upon satellite geometry. The resulting database contains individual points with average spacing of about 6 feet which are connected to make a very detailed line. The map images are made by digitally cutting and combining hundreds of USGS topographical maps into smaller maps that reflect the trail corridor. The line and waypoint data was added and final images created for printing. Old map lines depicting the CDT, which are wildly erroneous in some places, were removed to prevent confusion.

## How to use these maps:

These maps are intended to be used in conjunction with navigation tools such as a GPS receiver and/or compass. The maps show positions at critical intersections, stream crossings, and other features along the way. To save weight, the maps were reduced in scale from the original 1 inch = 2000 feet of the USGS maps to a scale of 1 inch = 3000 feet. The maps have UTM grid lines drawn on them to assist in navigation. There is a scale bar on every map to assist in locating a GPS position from the UTM grid. (See **With a GPS** for details.)

The trail is divided into hiking segments for the purpose of the guide. A typical title looks like this: **Map 1 Seg 1 Mi 0.0 to 06.1**. This means that the map covers part of Segment 1, and is used to travel from waypoints at mile 0.0 to mile 6.1. A subsequent map titled **Map 2 Seg 1 Mi 5.6 to 13.9** would cover Segment one, mile 5.6 to mile 13.9. The mileages begin in each segment with 0.0 and finish with the length of the segment.

## Map symbols and GPS Coding:

**Red lines** depict trail. **Black lines** depict roads.

A gps point name consists of a mileage and descriptor. Decimal points are assumed to 1/10th of a mile. The coding for the point **12\_363XR** means segment 12, mile 36.3, Intersection, turn Right.

### **Codes:**

**TH, AP**=Trailhead or Access Point.

**XX, XR, XL** describe trail intersections. **XR**=Right turn. **XL**= Left turn. **XX**=Ahead without turning.

**RX, RR, and RL** describe road intersections. **RR** = Right turn. **RL** = Left turn. **RX** = Ahead without turning.

**HP, T, RT**= High Point. Ridges, passes, saddles.

**MC, MS**= Markers, Cairns or Signs. Noted in places where the trail is poorly defined. Very useful as gps navigation points.

**GT**=Gate

**WT**= Water - found in dry year 2014. **WS**= Seasonal Water  
**WR**= Hiker reported water sources with date found.

**M**=Mileage marker only, no feature.

**OP**= Other Point. This is a sort of catch-all for miscellaneous points along the trail such as boundaries, power lines, buildings, etc.

## Understanding UTM Coordinates

The best way to think of a rectangular coordinate system is to view the earth as a giant checkerboard of equally sized squares. UTM coordinates tell you where you are on the board. The easting (X) value is how many meters you are east of a projected longitude line. The Y value tells you how far north you are of the equator. If you are heading towards a waypoint, your gps will display where you are on the checkerboard, and how far you have to go to get where you want to go. This is also possible in a latitude and longitude system, but it is generally easier to think of your position in terms of meters as opposed to degrees, minutes, and seconds. The maps have this checkerboard already drawn as light blue lines in 2000 meter intervals.



This example shows part of a map with the trail on it. The light blue lines are the UTM grid. The Eastings (X) are printed along the bottoms and tops of the maps, and the Northings (Y) are printed along the sides in blue. In the example, the first Northing is 4,922,000. The first Easting is 388,000. To locate a place on the map, you have to measure how far east (or west) and north (or south) it is from the nearest blue lines. (Remember the lines are 2,000 meters apart.) Now look at the waypoint located at mile 12.5. It is possible to determine its UTM position by measuring how far east it is of the nearest north-south line and how far north (or south) it is of the east-west line. Without even measuring, I would guess it is not quite halfway to the 390,000 meter line. I would guess about 900 meters east of the 388,000 meter line.

Adding this value to the value of the line measured from, plus my easting (X) would be 388,900. It is north of the blue line, which is 4,922,000 meters. I would guess halfway, or 4,923,000 meters. Checking the actual position of the waypoint in the file, it is 388,865 E and 4,923,013 N.

My guess was within 40 meters of the actual location! If you use a specialized ruler, known as a scale, you can do much better than a guess. Scales are printed on every map. You can easily create your own portable scale by tracing a printed one onto a piece of paper or thin cardboard. Then you will be able to quickly determine your gps location on the maps.



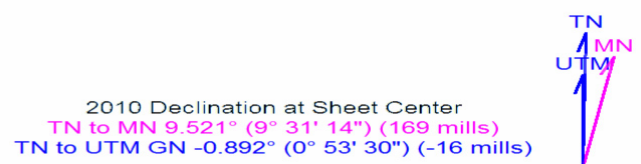
If you think you might be lost simply reverse the process to find out where you are. Turn on the gps, read your UTM location, and transfer that to the map using

the scale. You will be able to see where you are on the map. To get back on track navigate to the nearest waypoint to where you are and continue your trek.

**Important!!!** None of this information will be of much help if your gps is set up wrong. In order to use this data your gps *MUST* be set up in **WGS84** *BEFORE* you type in any data! If you want your gps data to match the maps then it must be this way.

GPS receivers all have a Setup screen where you can choose between many different systems, datums, and formats. On many Garmin units, try **SETUP> UNITS>** and select **UTM UPS** from the list. Click on **MAP DATUM** and select **WGS 84** from the list. That's it – you are ready to go. Some of the newer Garmins will use slightly different terms: **SETUP> Position Format>UTM UPS>Map Datum WGS84**. Magellan units are similar. Press **MENU>Setup>Map Datum>WGS84** Then press **Coord System>UTM**.

**Using a compass:** A North-South arrow is printed on every map. The pink line represents magnetic north. To orient the map, lay a compass parallel and along the edge of the pink line, then rotate the map until the compass needle points to zero. The map should now be oriented properly. Move the compass around on the oriented map to determine a bearing ahead. To set the declination in the compass, follow the step above then move the compass to the left or right edge of the map. (Note: this will differ depending upon whether the map is printed in a portrait or landscape orientation.) Being careful to not move the map, adjust the compass so the needle points to zero. Now the compass will point to true north whenever the needle points to zero. Declinations are calculated for every map and change along the way, so the easiest way to orient is by using the declination arrow. Declinations are in a constant state of change. You should change the declination settings in your compass occasionally to that shown on the map currently in use. Any declination on a map published more than ten years in the past is likely to be significantly erroneous and should not be trusted.



**Example of a Magnetic Declination Arrow**