

Understanding GPS Coordinates

GPS coordinates are commonly displayed as latitude and longitude. Coordinates are expressed in hemisphere (h), degrees (D), minutes (M), and seconds (S), and are often represented in either of the following formats:



Format	Example
1. h ddd mm ss.s	(38°47'49.42"N, 121°43'18.68"W)
2. h ddd mm.mmm	(38° 47.824'N, 121°43.311'W)
3. h ddd.ddddd	(38.797062°, -121.721857°)

A simple mathematical calculation will allow you to convert between the above formats, and the above examples are different representations of the same coordinates.

Sample Problem: Conversion from degrees, minutes, seconds to decimal degrees

$$38 \text{ degrees, } 47 \text{ minutes, } 49.42 \text{ seconds North} = 38 + 47/60 + 49.42/3600 = 38.797062^\circ$$

Coordinates are commonly specified by two sets of numbers (separated by a comma in the examples above). The first set of numbers represents latitude, and the second set of numbers represents longitude. The reference point for zero latitude is the equator. Coordinates above the equator are represented by an "N" or a "+" symbol, and coordinates below the equator are represented by an "S" or a "-" symbol. The reference point for zero longitude is the Prime Meridian. Coordinates to the east of the Prime Meridian, up to 180°, are represented by an "E" or a "+" symbol. Coordinates to the west of the Prime Meridian, up to 180°, are represented by a "W" or a "-" symbol.

Latitude	Longitude
<div><div>"N" or "+"</div><div>Equator </div><div>"S" or "-"</div></div>	<div><div><div>"W" or "-"</div><div></div><div>"E" or "+"</div></div><div>Prime Meridian</div></div>

Many resources available for you to use in order to convert between coordinate formats, and locate or identify coordinates on a map, the following are an example of each:

- *Google Earth* allows you to locate or identify coordinates in either of the above used formats. You may also save locations using drop pins. Download Google Earth at earth.google.com
- <http://www.csqnetwork.com/gpscoordconv.html> allows you to convert between either of the above used formats