

Map Datums For SAR Planning and Operations

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A **MAP DATUM** is a mathematical model of the shape and size of the Earth used as a reference to project locations on the Earth and a map. Some datums cover smaller areas like the United States, and some cover the entire Earth. There are many different datums and they don't all agree on the locations. **Therefore, it is very important to know which datum your map, GPS, or other personnel are using. Datum accuracy is very important when trying to mark or relocate small items like small pieces of evidence or human tracks for example.**

When exchanging navigation information it is essential for accuracy that all users be on the same datum, or understand conversion of datums in a GPS unit.

Finding Map or GPS Datums

- **On USGS topo maps** - In the lower left corner with the technical map information block.
- **On other quality maps** - Search in the legend margins that give information on how the map was produced.
- **On a GPS receiver** – Datums are listed on a menu page. Consult your manual.

Common Datums (Particularly in the U.S.)

- **North American Datum 1927 (There are several different NAD27 datums for different areas of the world i.e. CONUS = (Continental United States)**
- **North American Datum 1983 (NAD 83)**
- **World Geodetic System 1984 (WGS 84)**
- **WGS 84 and NAD 83** are almost identical and interchangeable.
- Computer mapping software lets you pick from several common datums to produce a map in print or on screen.
- The entire GPS system uses **WGS 84**. Your GPS receiver will convert to any datum you wish to see on your GPS screen.

Maps, Datums, and SAR Resources, *Always check the datum of the map you intend to use.*

- **Helicopter and Fixed Wing Aircraft** = WGS84. Sectional charts are **WGS 84 or NAD 83**.
- **USGS Topo Maps** = NAD 27. Typically SAR ground resources, but not always. **Some topos may be in NAD83. Indications are that USGS intends to start using NAD83 or WGS84 as a datum in the future.**
- **U.S. Forest Service Maps** = NAD 27. Typically ground SAR for large area planning and road navigation.
- Many resources may come to a large SAR operation unfamiliar with datums or with a favorite datum. When unsure of the datum - ***always ask the source of information for clarification, and coordinate this datum information.***

Datum Offsets – The location difference of the same waypoint from one datum to another. Datum offsets differ in different coordinate formats. Many U.S.G.S. topo maps will show the datum offset for lat /long as a hash mark near the corners of the map. Similar information is located in the technical map info, lower left corner.

Lat/Long. Generally east - west offset.

UTM Generally a larger NW - SE offset.

Distances can vary by location.

NOTE: With the advent of GPS in SAR operations it is critical that a navigation briefing be held, or navigation information be included in an ICS planning packet that clearly outlines the datums, coordinates, and compass declination format to be used. It is ideal if all resources can use one datum, coordinate, and compass system. But that is not always possible.

Be alert in large SAR operations with many resources. This is where coordinate and datum issues will appear and can cause considerable confusion.