DYNAMIC_HT

The dynamic height of a benchmark is the height at a reference latitude of the geopotential surface through the benchmark. This value is of interest because two stations with different orthometric heights may have similar geopotential, due to undulations of the geopotential reference surface (geoid). The source of a dynamic height is always computed. The reference latitude for the United States is North 45 degrees.

The dynamic height is computed from a geopotential height. The geopotential height (a.k.a. geopotential number) is determined by:

$$geopotential\_ht = ortho\_ht * (gravity + (4.24E\text{-}5 * ortho\_ht))$$

A dynamic height is then obtained by dividing the adjusted NAVD88 geopotential height of a bench mark by the normal gravity value (G) computed on the Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45 degrees latitude (G = 980.6199 gal).

A related unit for measuring geopotential is the geopotential number (C), which was adopted by the IAG in 1955. The geopotential number equals the dynamic weight multiplied by the normal gravity at the reference latitude:

$$C = H(dynamic) * gamma(ref).$$

The geopotential number (C) is measured in geopotential units (g.p.u.), where:

1 g.p.u. = 1 kgal meter = 1000 gal meter.

Since local gravity near sea level is approximately 0.98 kgal, the magnitude of geopotential numbers (C) are approximately that of orthometric height in meters, which leads to better intuitive understanding.