GRAVITY SURVEY CORRECTION

NAME	*REASON*	*CORRECTION*
Observed Gravity (gobs)	Gravity readings observed at each gravity station after corrections have been applied for instrument drift and earth tides.	Worden measurements are in "divisions". There is a "dial constant" in mgals/div. Convert div. measurements to mgals. Repeat measurements at a base station. each hour. Remove any trend in the base station – removing a linear trend is the easiest.
Latitude Correction (g_n)	Correction from *gobs* that accounts for Earth's elliptical shape and rotation. The gravity value that would be observed if Earth were a perfect (no geologic or topographic complexities), rotating ellipsoid is referred to as the *normal gravity*. Gravity INCREASES with increasing latitude. Correction is ADDED as we move toward the equator. Correction is applied ONLY for relitive movement in the N-S direction. Correction for a given latitude is linear over about 1 km.	$g_n = 978031.85\ (1.0 + 0.005278895\ sin^2(lat) + 0.000023462\ sin^4(lat))\ (mgal)$ where *lat* is latitude Taking the derivative w.r.t. lat and converting to (m) from (rad) gives a correction of: $\Delta g_l = 0.000812 * sin(2 * lat)\ \ mgal/m$ (N-S)
Free Air Corrected Gravity (g_{fa})	The free-air correction accounts for gravity variations caused by elevation differences in the observation locations. (does NOT include the effect for mass between observed point and the datum)	$\Delta g_{fa} = 0.3086h\ (mgal)$ where *h* is the elevation (in meters) at which the gravity station is above/below the datum Correction is ADDED for stations ABOVE the datum Correction is SUBTRACTED for stations BELOW the datum
Bouguer Slab Corrected Gravity (g_b)	The Bouguer correction is a first-order correction to account for the excess mass underlying observation points located at elevations higher than the elevation datum (sea level or the geoid). Conversely, it accounts for a mass deficiency at observation points located below the elevation datum.	$\Delta g_b = -0.04193\ \rho\ h$ (mgal) ρ is average density of the rocks underlying the survey area in gm/cc Correction is SUBTRACTED for stations ABOVE the datum Correction is ADDED for stations BELOW the datum
Terrain Corrected Bouguer Gravity (gtc)	The Terrain correction accounts for variations in the observed gravitational acceleration caused by variations in topography near each observation point. Because of the assumptions made during the Bouguer Slab correction, the terrain correction is positive regardless of whether the local topography consists of a mountain or a valley.	g_{tc} is computed with tables or templates or by computer and is ADDED to g_{obs}.

Bouguer gravity is: $g_{obs} +/- \Delta g_n +/- \Delta g_{fa} -/+ \Delta g_b + \Delta g_{tc}$