

	Raw							
Grav ID	Dial Reading	Temp (F)	Dial Constant	mGal	Time	Min. Elapsed	%Elapsed	Drift Corr
F53	1278.0	79	0.09234	118.0	9:15	0	0	0
Grav1	821.5	79.5	0.09235	75.9	9:35	20	7.8125	0.026144
Grav2	928.6	80	0.09235	85.8	9:45	30	11.71875	0.039216
Grav3	967.7	80.5	0.09236	89.4	9:52	37	14.45313	0.048367
Grav4	1092.0	80.5	0.09236	100.9	10:02	47	18.35938	0.061439
Grav5	1145.7	79.5	0.09235	105.8	10:18	63	24.60938	0.082354
Grav6	1181.0	80	0.09235	109.1	10:26	71	27.73438	0.092811
Grav7	1196.0	79.5	0.09235	110.5	10:38	83	32.42188	0.108498
Grav8	1198.8	80	0.09235	110.7	10:50	95	37.10938	0.124184
Grav9	1197.3	79.5	0.09235	110.6	11:00	105	41.01563	0.137256
Grav10	1180.3	79.5	0.09235	109.0	11:12	117	45.70313	0.152943
Grav11	1170.1	79.5	0.09235	108.1	11:19	124	48.4375	0.162093
Grav12	1120.3	79.5	0.09235	103.5	11:40	145	56.64063	0.189544
Grav13	1094.4	79.5	0.09235	101.1	11:56	161	62.89063	0.21046
Grav14	1014.2	79.5	0.09235	93.7	12:22	187	73.04688	0.244447
Grav15	914.6	79.5	0.09235	84.5	12:58	223	87.10938	0.291506
F53	1274.1	80.5	0.09236	117.7	13:31	256	100	0.334644
Drift				0.3				

Note on F53 (base): Barnes value at F53 = 982113.7 mGal

Note on Dial Constant: Value of the Dial Constant was obtained from instrument specs from factory.

Note on mGal: The value at the base appeared 0.3 mGal less after the survey. This drift was linearly distributed (

Note on Drift-corrected mGal: these values have had the drift correction applied.

Note on Grav: These values were obtained by adding 982113.7 to all stations to obtain the published value for F5

Drift Corrected mGal	Grav
118.0	982231.7
75.9	982189.6
85.8	982199.5
89.4	982203.1
100.9	982214.6
105.9	982219.6
109.2	982222.9
110.6	982224.3
110.8	982224.5
110.7	982224.4
109.2	982222.9
108.2	982221.9
103.6	982217.3
101.3	982215.0
93.9	982207.6
84.8	982198.5
118.0	982231.7

over the day's readings.

Drift & Temperature		WGS84				Position		Distance
Corrected Grav	Grav-Sta	RTK-Sta	Lat(decimal)	Lon(decimal)	GIF(mgals)	Elev(m)	SBA(mgals)	along line Error(m) (meters)
982231.7	F53							
982189.6	grav1	PT006	64.90301933	-147.8001918		362.61		0.0188 0
982199.5	grav2	PT007	64.90499562	-147.8081473		313.15		0.0233 434
982203.1	grav3	PT008	64.90494584	-147.8128635		296.01		0.0708 634
982214.6	grav4	PT009	64.90724145	-147.8201287		236.46		0.0426 1049
982219.6	grav5	PT014	64.90844838	-147.8254833		209.11		0.0221 1334
982222.9	grav6	PT010	64.91030152	-147.8262722		193.41		0.0173 1470
982224.3	grav7	PT015	64.91210361	-147.8329425		186.86		0.0175 1842
982224.5	grav8	PT016	64.9136525	-147.8412373		187.36		0.0267 2264
982224.4	grav9	PT017	64.9163546	-147.8462174		190.79		0.0155 2624
982222.9	grav10	PT018	64.91767631	-147.8529085		196.63		0.025 2967
982221.9	grav11	PT011	64.91960641	-147.8588719		205.45		0.017 3319
982217.3	grav12	PT012	64.92288346	-147.8682214		233.52		0.0199 3887
982215.0	grav13	PT019	64.92463359	-147.8713656		252.81		0.0278 4120
982207.6	grav14	PT020	64.92638203	-147.8763509		298.09		0.042 4424
982198.5	grav15	PT021	64.92830543	-147.8802465		343.07		0.0174 4698
982231.7	F53							

YOUR ASSIGNMENT - Given the observed data, execute the latitude, free-air, and Bouguer corrections as described below. Plot and compare to models.

Observed Data:

Corrected Grav - Temperature correction and drift correction applied

Grav - Sta - Gravity Station Name

RTK - Sta - RTK Station Name

Lat (decimal), Lon (decimal) - Latitude, Longitude in decimal degrees

Elev (m) - Station Elevation above mean sea level

Position Error (m) - Station position error in meters estimated by the RTK system

Distance Along Line (meters) - Distance in meters from Grav16 - useful for plotting

Computed values:

Step 1 First compute the predicted Gravity (**GIF**) using the 1967 Gravity Formula:

GIF = $978031.8(1 + .0053024 * (\sin(\text{lat}))^2 - .0000058 * (\sin(2 * \text{lat}))^2)$

**Remember, MSEXcel expects radians as the argument for the sin() function. (Hint, look for help on "radians")

Step 2 Then compute the Simple Bouguer Anomaly (**SBA**) as below:

$\text{SBA} = \text{Corrected Grav} - \text{GIF} + .3085 * \text{Elev (m)} - .04188 * 2.67 * \text{Elev (m)}$

Step 3 Then plot Elevation vs. Distance along line, and SBA vs. Distance along line.

Step 4 Finally, compare the SBA to the model curves and speculate (wildly) about the bedrock surface.

Assume (at first) that densities we used in the models were close to correct.

Compare the modeled amplitudes to what we found, How much relief on the bedrock could we infer?

The results are much more asymmetric than we expected -- why's that?