

Underway Geophysics Lab Cookbook

GMT ZONES AND DEPTH CORRECTIONS

GMT ZONES

You can calculate your GMT zone by dividing the Longitude by 15. Round your result to the nearest integer.

EAST = NEGATIVE WEST = POSITIVE
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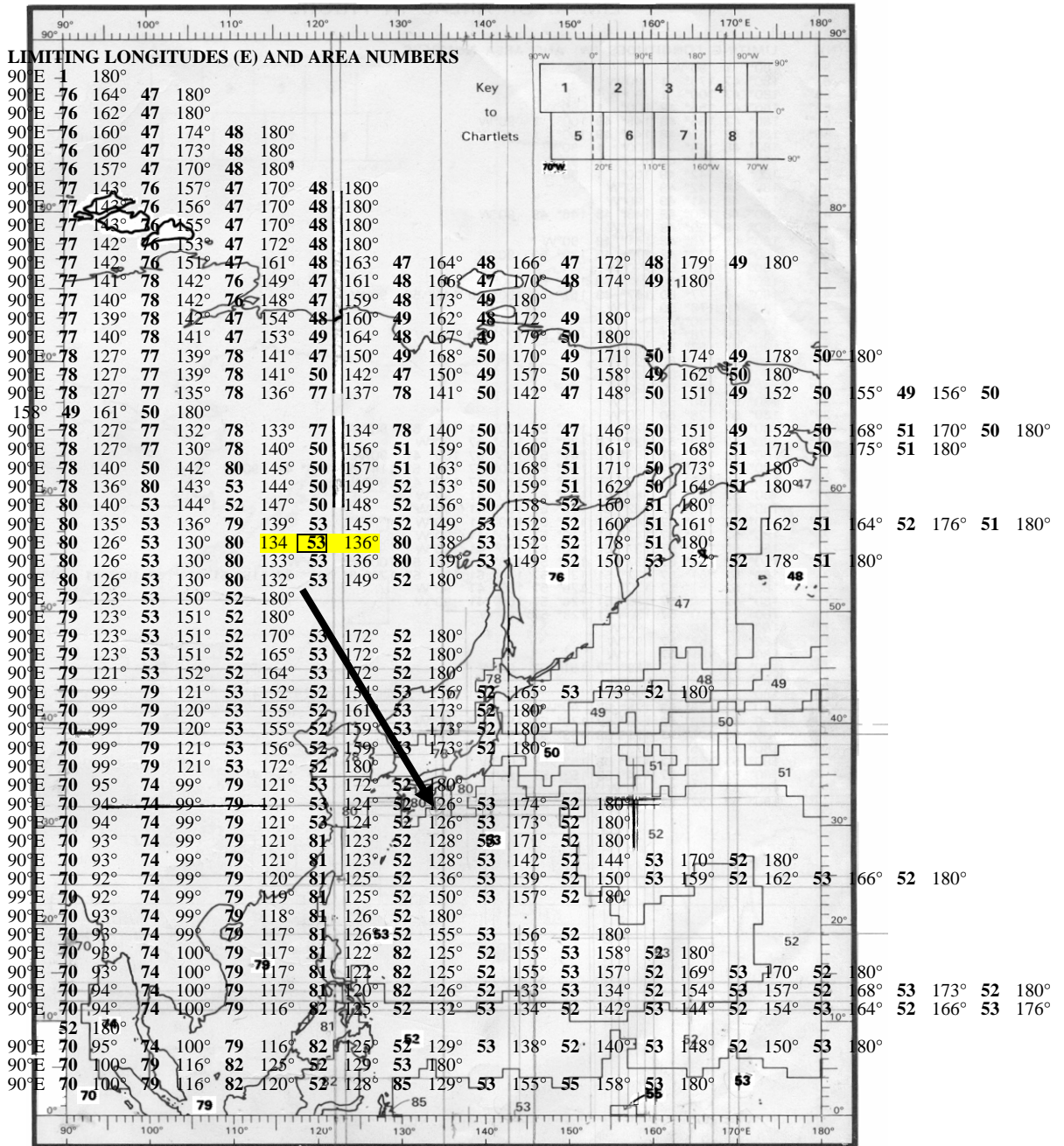
Example: Your longitude is E133°. $133/15 = 8.8 \rightarrow$ round it to 9.

You are in **ZONE -9**, so you get the GMT by subtracting 9 hours from your local time, or add 9 hours to the GMT to get the local time.

DEPTH CORRECTIONS

When getting on site, leave the 3.5 kHz recorder running. When the OPS tell you, go get the correct depth for the drillers.

- 1) Zero the recorder. Move the depth reader all the way to the left (on the line where the print starts) and make sure it reads the top of the current range. For instance, if the range is 3750-4500, make sure on the left edge of the printing area the depth meter reads 3750 and not 3748 or something. IF the reading is not correct, adjust it by turning the “ZERO” knob. Perform the same calibration on the bottom of the range. This is done by turning the “FULL SCALE” knob.
- 2) Read the depth on the recorder. Write it on the Depth Correction Worksheet (in “Uncorrected Depth to the Transducer”).
- 3) Write down your location from the Winfrog screen, for instance N32 21.2100, E134 56.70. Find the position on one of the charts in the ECHO-SOUNDING CORRECTION TABLES book.



You will notice that you cannot really be sure whether you now are in zone 53 or 80. No worries, there is a tool for this. On the adjacent page to the map, we have LIMITS OF AREAS IN FIGURE 3.

LIMITS OF AREAS IN FIGURE 3

LAT(N)

67°-90°
60°-67°
59°-60°
58°-59°
55°-58°
52°-55°
51°-52°
50°-51°
49°-50°
47°-49°
46°-47°
45°-46°
44°-45°
43°-44°
42°-43°
41°-42°
40°-41°
39°-40°

38°-39°
37°-38°
36°-37°
35°-36°
34°-35°
33°-34°
32°-33°
31°-32°
30°-31°
28°-30°
27°-28°
26°-27°
25°-26°
24°-25°
23°-24°
22°-23°
21°-22°
20°-21°
18°-20°
16°-18°
15°-16°
14°-15°
13°-14°
12°-13°
11°-12°
10°-11°
9°-10°
8°-9°
7°-8°
6°-7°
5°-6°
4°-5°

3°-4°
1°-3°
0°-1°

Now, the latitude in our example is between 32 and 33 degrees, so go to that row. The longitude in our case was 134° 56.70, so that is between 134 and 136 degrees. Follow the “32°-33°” row until you get between 134 and 136. There you can read that the correct depth correction table to use in this case is the table number 53.

53

1500m/s

Observed

Depth (m)	0	10	20	30	40	50	60	70	80	90
200	205	215	225	235	245	255	265	275	285	296
300	306	316	326	336	346	356	366	376	386	396
400	406	416	425	435	445	455	465	475	485	495
500	505	515	525	535	545	554	564	574	584	594
600	604	614	624	634	644	654	663	673	683	693
700	703	713	723	733	743	753	763	772	782	792
800	802	812	822	832	842	852	862	871	881	891
900	901	911	921	931	941	951	960	970	980	990
1000	1000	1010	1020	1030	1040	1049	1059	1069	1079	1089
1100	1099	1109	1119	1129	1138	1148	1158	1168	1178	1188
1200	1198	1208	1218	1228	1237	1247	1257	1267	1277	1287
1300	1297	1307	1317	1327	1336	1346	1356	1366	1376	1386
1400	1396	1406	1416	1426	1436	1445	1455	1465	1475	1485
1500	1495	1505	1515	1525	1535	1545	1554	1564	1574	1584
1600	1594	1604	1614	1624	1634	1644	1654	1664	1673	1683
1700	1693	1703	1713	1723	1733	1743	1753	1763	1773	1783
1800	1792	1802	1812	1822	1832	1842	1852	1862	1872	1882
1900	1892	1902	1912	1922	1931	1941	1951	1961	1971	1981
2000	1991	2001	2011	2021	2031	2041	2051	2061	2071	2081
2100	2091	2100	2110	2120	2130	2140	2150	2160	2170	2180
2200	2190	2200	2210	2220	2230	2240	2250	2260	2270	2280
2300	2290	2300	2310	2320	2330	2340	2350	2360	2370	2380
2400	2389	2399	2409	2419	2429	2439	2449	2459	2469	2479
2500	2489	2499	2509	2519	2529	2539	2549	2559	2569	2579
2600	2589	2599	2609	2619	2629	2639	2649	2659	2669	2679
2700	2689	2699	2709	2719	2729	2739	2749	2759	2769	2779
2800	2789	2799	2809	2819	2830	2840	2850	2860	2870	2880
2900	2890	2900	2910	2920	2930	2940	2950	2960	2970	2980
3000	2990	3000	3010	3020	3030	3040	3050	3060	3070	3080
3100	3090	3101	3111	3121	3131	3141	3151	3161	3171	3181
3200	3191	3201	3211	3221	3231	3241	3251	3262	3	3181
272	3282									
3300	3292	3302	3312	3322	3332	3342	3352	3362	3372	3383
3400	3393	3403	3413	3423	3433	3443	3453	3463	3473	3483
3500	3494	3504	3514	3524	3534	3544	3554	3564	3574	3585
3600	3595	3605	3615	3625	3635	3645	3655	3665	3676	3686
3700	3696	3706	3716	3726	3736	3746	3757	3767	3777	3787
3800	3797	3807	3817	3828	3838	3848	3858	3868	3878	3888
3900	3898	3909	3919	3929	3939	3949	3959	3970	3980	3990
4000	4000	4010	4020	4030	4041	4051	4061	4071	4081	4091
4100	4102	4112	4122	4132	4142	4152	4163	4173	4183	4193
4200	4203	4214	4224	4234	4244	4254	4264	4275	4285	4295
4300	4305	4315	4326	4336	4346	4356	4366	4377	4387	4397
4400	4407	4417	4428	4438	4448	4458	4468	4479	4489	4499
4500	4509	4519	4530	4540	4550	4560	4571	4581	4591	4601
4600	4611	4622	4632	4642	4652	4663	4673	4683	4693	4704
4700	4714	4724	4734	4745	4755	4765	4775	4786	4796	4806
4800	4816	4827	4837	4847	4857	4868	4878	4888	4898	4909
4900	4919	4929	4939	4950	4960	4970	4980	4991	5001	5011
5000	5022	5032	5042	5052	5063	5073	5083	5094	5104	5114
5100	5124	5135	5145	5155	5166	5176	5186	5197	5207	5217
5200	5228	5238	5248	5258	5269	5279	5289	5300	5310	5320
5300	5331	5341	5351	5362	5372	5382	5393	5403	5413	5424
5400	5434	5444	5455	5465	5475	5486	5496	5506	5517	5527
5500	5537	5548	5558	5568	5579	5589	5599	5610	5620	5630
5600	5641	5651	5662	5671	5682	5693	5703	5713	5724	5734
5700	5744	5755	5765	5776	5786	5796	5807	5811	5827	5838
5800	5848	5859	5869	5879	5890	5900	5911	5921	5931	5942
5900	5952	5963	5973	5983	5994	6004	6015	6025	6035	6046
6000	6056	6067	6077	6087	6108	6098	6119	6129	6139	6150
6100	6160	6171	6181	6192	6202	6212	6223	6233	6244	6254

Let's say you read 5354 m. Go to the row **5300**. Your uncorrected depth is between 5350 and 5360, so you find your lesser depth limit in column **50** and your greater depth limit in column **60**. Use the following formula to calculate the corrected depth:

$$x = \frac{n}{10} * (b - a) + a$$

Where **x** is the corrected depth
n is the last digit of your original depth
a is the lesser depth limit
b is the greater depth limit

In this example, $x = 4/10 * (5393-5382) + 5382 = 5386.4$

Write your sheet. In this example, the uncorrected depth is 5354m and the corrected depth 5386.4 m. The following example is showing all the information you need to worry about. The OPS will take care of the rest.

PDR DEPTH CORRECTION WORKSHEET	
AREA	<u>53</u>
HOLE	<u>1234 A</u>
DATE	<u>MAY 16 2001</u>
A. Uncorrected Depth to Transducer:	<u>5354</u> m
B. Corrected Depth to Transducer:	<u>5386.4</u> m
C. Transducer to Dual Elevator Stool (DES):	+ 18.4 m
G. Total Drilling Depth (B+C):	<u>5404.8</u> m
E. Transducer to Sea Level (Mean Draft + 0.91m):	_____m
F. Water Depth (B+E):	_____m