

ACRUP

ANTARCTIC CRUSTAL PROFILE

Submitted By

Uri ten Brink and Jie Zhang
USGS Woods Hole Oceanographic Institute
Woods Hole MA 02543

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1408 NE 45th Street
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Antarctic CRUstal Profile (ACRUP)

PI: Dr. Uri S. ten Brink
(USGS, Woods Hole, MA 02543)

Field technician: Jie Zhang
(USGS contractor; currently at MIT, Cambridge, MA 02142)

The Antarctic Crustal Profile (ACRUP) is a multidisciplinary research project that was carried out in the Ross Sea area under the auspices of the Italian National Research Antarctic Program (PNRA), by a number of universities and research institutes in Italy, Germany and the U.S. during the austral summer of 1993/1994. The project included offshore and onshore seismic experiments, integrated by geological and geophysical investigation along a traverse about 200 km long from the Victoria Land basin to the Polar Plateau across the Transantarctic Mountains (TAM). The United States Geological Survey deployed 12 portable broadband seismic stations (Reftek) during the land refraction and wide-angle reflection experiment with instrumentation available through the IRIS' PASSCAL program. The onshore data were collected along a 150-km-long E-W profile by 58 seismometers at 3-km interval. The energy sources for this experiment were four land explosions (530 kg dynamite, 80, 150 and 300 kg pentrite).

In this data set, we include records for the four shots collected by the PASSCAL stations in SAC format. Unfortunately, records from Italian and German stations are not allowed to release. For the entire seismic array, the station spacing is about 3 km. Shooting times of all four shots have been corrected on the basis of the GPS control time and the first arrival traveltimes to the near-shot station. The overall waveform quality is poor because of strong attenuation in the firn and ice.

A map in Postscript format (map_ACRUP.ps) shows the survey area. The detailed station coordinates are given in the plain text file (cood_ACRUP). Another Postscript file (sta_ACRUP.ps) shows the station locations and the ice thicknesses beneath the stations, which were resolved from a radar survey.

The following list consists of the published abstracts or papers regarding the ACRUP project.

Zhang, J., U. S. ten Brink, A. K. Cooper, B. Della Vedova, 1994, Seismic wave propagation through the firn and ice near Starr Nunatak, Antarctica, EOS, Transactions, American Geophysical Union, 75, No.20, 239.

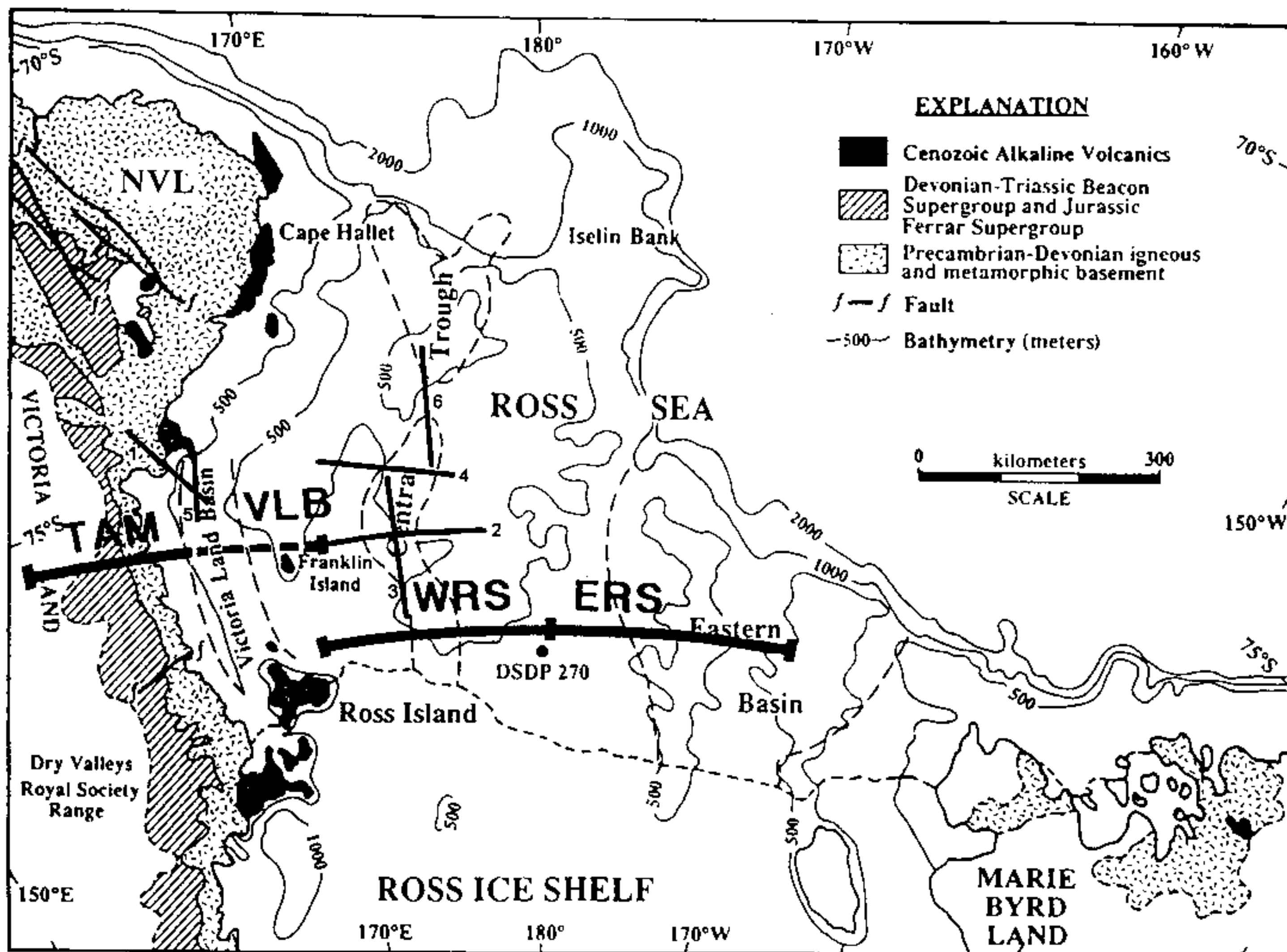
Zhang, J., U. S. ten Brink, B. Della Vedova, 1995, Nonlinear refraction traveltimes tomography: imaging upper crustal structure of the Transantarctic Mountains, EOS, Transactions, American Geophysical Union, 76, No.46, 388

Della Vedova, B., J. Makris, U. S. ten Brink, and J. Zhang, 1995, Crustal transect of the Transantarctic Mountains in the western Ross Sea area, Antarctica, EOS, Transactions, American Geophysical Union, 76, No.46, 551.

Cooper, A. K., Cochran, G., Zhang, J., Brancolini, G., Pellis, G., and F. Egloff, 1995, The Antarctic crustal profile seismic project, Ross Sea, Antarctic Journal, 29(5), 15-18.

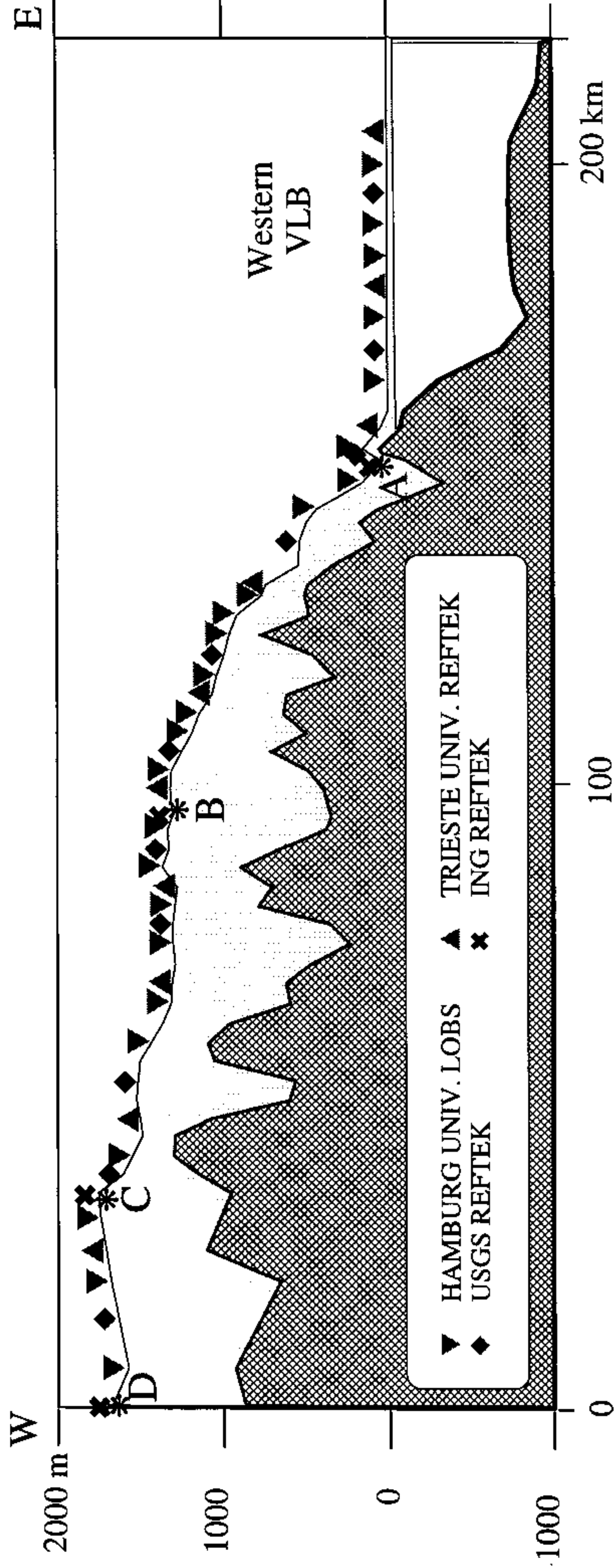
Della Vedova, B., G. Pellis, H. Trey, J. Zhang, A. K. Cooper, J. Makris, ACRUP working group, 1996, Crustal structure of the Transantarctic Mountains, Western Ross Sea, VII ISAES Proceedings.

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TAM Segment

Ice Thickness and Location of Seismic Stations



Land Shot Location

shot	Lat	Long
A	-75 53 09.11	162 31 34.50
B	-75 49 52.83	160 29 58.40
C	-75 64 58.23	158 18 45.23
D	-75 42 02.59	155 05 02.26

Land Recording Station Location

station	Lat	Long
I	-75 53.90'	162 34.71'
I	-75 52 46.65	162 46 38.32
G	-75 52.03	162 39.59
U	-75 52 32.74	162 37 38.58
G	-75 52 41.70	162 27 06.92
G	-75 52 33.95	162 17 45.69
G	-75 52 30.13	162 13 07.67
U	-75 52 23.10	162 06 17.96
G	-75 52 19.08	161 57 54.56
I	-75 52 00.79	161 51 03.59
G	-75 51 54.52	161 47 21.22
G	-75 51 49.78	161 40 20.36
G	-75 51 38.66	161 33 16.46
U	-75 51 24.75	161 26 13.24
G	-75 51 11.63	161 18 44.66
I	-75 51 00.08	161 12 34.39
G	-75 50 48.26	161 05 45.11
G	-75 50 38.37	160 59 12.47
U	-75 50 25.04	160 52 47.61
G	-75 50 11.55	160 46 05.22
I	-75 50 03.03	160 39 31.13
I	-75 49 52.80	160 29 48.82
G	-75 49 36.02	160 25 32.33
U	-75 49 24.18	160 18 19.81
G	-75 49 12.62	160 12 08.97
I	-75 49 01.01	160 05 02.90
G	-75 48 48.37	159 58 17.58
U	-75 48 36.05	159 52 10.03
G	-75 48 18.01	159 45 30.10
G	-75 48 02.17	159 38 13.66
I	-75 47 46.07	159 32 01.89
G	-75 47 30.24	159 25 05.03
U	-75 47 17.86	159 18 04.14
G	-75 47 08.50	159 45 30.10
G	-75 46 54.33	159 04 46.82
U	-75 46 36.26	158 57 53.35
G	-75 46 25.35	158 51 22.66
I	-75 46 06.77	158 44 55.10
G	-75 45 47.88	158 38 49.53
G	-75 45 32.29	158 31 27.02
U	-75 45 17.41	158 25 02.50
I	-75 44 58.23	158 18 45.23
G	-75 44 35.27	158 08 30.96
I	-75 44 14.43	157 58 44.64
G	-75 43 54.05	157 48 07.84
U	-75 43 16.40	157 35 16.46
G	-75 42 29.19	157 18 15.58
I	-75 42 02.60	157 05 02.26

I -Italian reftek station

U -USGS reftek station

G -German LOBS station