Reflection Displays

The reflection sections have been prepared from SEG-Y digital files from the Geoscience Australia archives. As far as possible we have used migrated record sections so that the positioning of reflectivity is as accurate as the 2-D assumptions inherent in line processing will allow. Much of the older data collected with explosives has not been migrated, and here we use the stacked traces.

The reflection sections have been prepared using the Python script detailed in the Appendix, using the facilities of Seismic Un*x (Center for Wave Propagation, Colorado School of Mines) and Generic Mapping Tools (GMT – Wessel & Smith, 1998).

Each panel of up to 220 km of reflection section is displayed on a uniform horizontal and vertical (time) scale using similar display parameters based on a combination of trace biasing and clipping. The display parameters used for the sections have been chosen to give a representation in which the character of the reflectivity is clear and the sections are not too dark so that detail can be discerned. A very slight time gain has been applied ($t^{0.05}$) to slightly enhance the deeper part of the section. In a few cases, particularly for older data where only a set of stacked traces was available, some significant tuning of the display has proved necessary to achieve a satisfactory result.

Up to 220 km of reflection profile are displayed on a single panel, with a generous overlap between the segments of longer profiles to provide continuity of view. The sections are displayed at approximately V:H 1 to 1 scale, based on an r.m.s. crustal velocity of 6 km/s. The reflection panels are annotated with two-way reflection time on the left (to 20 s) and the approximate depth conversion on the right (to 60 km). Each reflection section is accompanied by a map strip following the profile segment with Common Depth Point (CDP) numbers superimposed on geological information from the national 1:1M digital compilation (Raymond, 2012) displayed at 1:600,000 scale when printed on an A3 sheet. The grid interval is 0.5 degrees in latitude and longitude. The reflection sections are presented without any superimposed interpretation. The approximate position of crossing lines are indicated by markers.

The reflection results are grouped by six geographic regions and then displayed in related groups. Reflection profiles acquired prior to 1998 used explosive sources with limited fold so that noise suppression is uneven, and in many cases only stacked traces are available. Nevertheless these older sections still provide valuable information for many parts of the country. From 1999 (Survey L148) the reflection data were acquired using vibrator sources with much higher fold of cover, so that the signal is enhanced. The extensive reflection work since the establishment of ANSIR means that modern data are available for many parts of the continent.

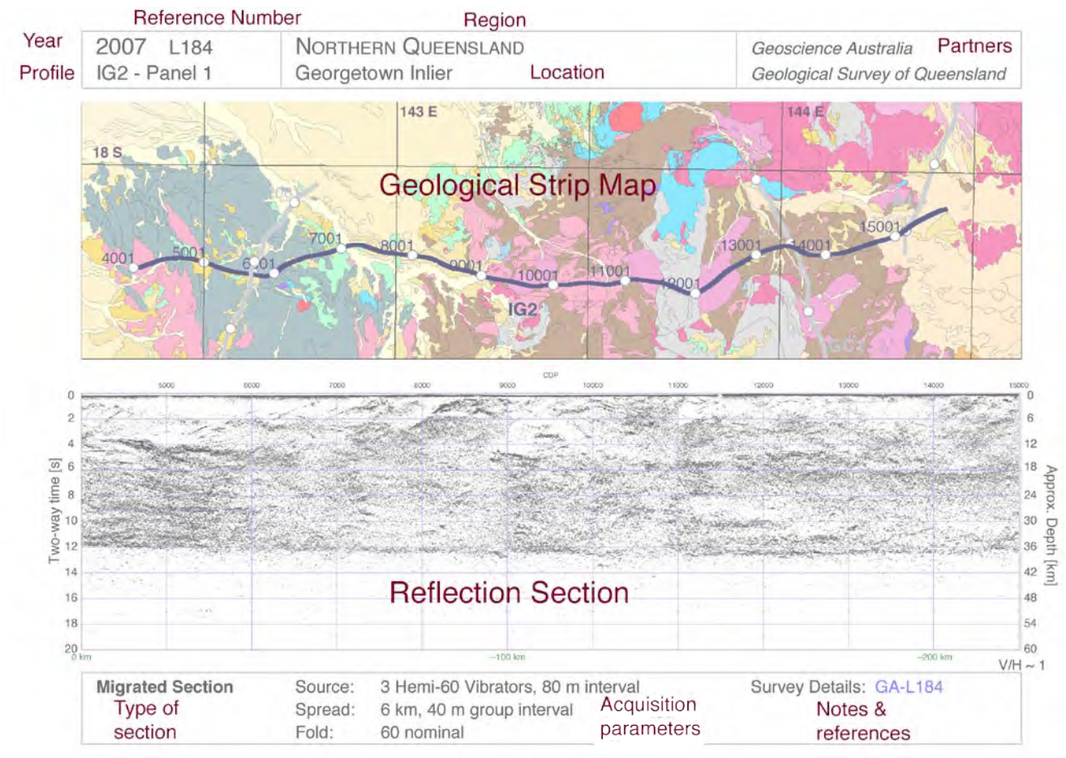
Each reflection panel is accompanied by summary information on the acquisition parameters employed, with a link to more detailed information on the survey and interpretation. The sections are annotated as *Migrated* or *Stacked* in the lower display panel. An example panel with the various elements marked is shown below.

References

Raymond, O.L., 2012. Surface Geology of Australia (1:1M scale dataset) A3 map. Geoscience Australia, Canberra.

Wessel, P. & Smith, W.H.F., 1998. New, improved version of the Generic Mapping Tools Released, *EOS Trans. AGU, 79*, 579.

Example panel



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