Book C

Field-Recorded Seismic Sections

By
Robert W. Lankston
3-16-2017

The field recordings from the 1970 Wold-Crosby Flathead Lake seismic survey were scanned in 2006 at 600 dots per inch (dpi). The files were very large, and I downsized the for this archive in 2013 by a 50% scaling to 300 dpi. I still have the 600 dpi files should you want them.

Line I was too long to fit on the scanner. Therefore, it was scanned into two files labeled I1 and I2. Line Q, though presented on the Silverman et al. (1971) map as a single line, was actually recorded in three segments, and the field-recorded sections are labeled Q1, Q2, and Q3. The Silverman et al. map indicates a Line M and a Line MW (M west). However, only one field recording is labeled M, and it is presumed to include both segments.

The set of field recordings also includes two that are labeled B. The scanned files for these are labeled B1 and B2. File B1 is presumed to contain the actual data for Line B. Comparison of the Line B data from the USGS archive tape with the field-recorded seismic section verifies this.

The timing lines on most of the field recordings are at 25 ms intervals. The timing line interval should be checked, though. The two way time to the water bottom reflector can be calculated from depths on the bathymetric sections or depths taken from the Silverman et al. (1971) map. The calculated two way time should be consistent with the interpreted time on the field-recorded seismic section and the corresponding redisplayed seismic section.

Line Jw is a prime example of difficulty in determining time zero and the timing line interval. Longer lines, along which the water bottom event varies across one or more timing lines, are easier to resolve.

The timing lines on the field-recorded sections have lateral gaps at five minute intervals (Simpkin, 2007). Near the bottoms of the field recordings are notations of clock time. These times appear to be the times of sextant positioning sightings. Except for B, the field sections indicate the date on which the line was recorded. Interestingly, the lines do not seem to have been recorded in any systematic order.

The width of the chart paper for the original field-recorded sections (time dimension) was 19 in (Simpkin, 2007). In the original sections, the timing lines are approximately 1 in apart. At some unknown time, approximately 7 in of the original paper sections were removed from the bottoms of most of the field sections.

Line J is a notable exception. Only 2 in appear to be missing from the Line J section. The crease along which the Line J field-recorded section is now folded can be seen in the scanned image. This crease is near the point at which the other sections were trimmed. I believe that the sections were actually trimmed as opposed to the paper sections tearing apart, quite literally, through wear and tear along the crease with the bottom piece then being disposed of.

Someone clearly took the time to transcribe the information that was at the bottoms of the original recording sto the upper parts that remained after the trimming.

The removal of the so much of the paper section resulted in the loss of geologic data in areas of the lake with deep water. The line name, recording direction, and time annotations are presumed to have been transcribed faithfully from the removed strip to their current locations on the sections. As mentioned above, the two field sections for Line B do not have a date. Whether this was an oversight during field operations or an oversight after the section was trimmed and the annotations were being transcribed is not known.

Some of the sections have interpretation lines, i.e., faults and horizons, or numbers that indicate the arrival times of events marked on them. Except for the interpretations drawn on some of the field recordings, the sections are remarkably "clean" considering their age.

Most of the scans of the field recordings have a corresponding scan of a redisplay of the data. Notable exceptions include:

- the file labeled B2 in the set of field sections has no counterpart in the redisplayed set.
- the short western extension of Line J across Indian Bay is labeled Jw on the Silverman et al. (1971) base map and on the field recording. The redisplayed section is labeled Je.
- Lines K, Q3, S, and T have two redisplayed sections. The second version of Q3 is labeled Q4 in the redisplayed set. Lines K, S, and T each have a version 1 and a version 2, i.e., K1 and K2, and so forth.

The file names in the archive reflect the line name annotations on the original documents.

No original section exists for Line H. According to the Silverman et al. (1971) base map, Line H extended from the survey crew's base of operations at Yellow Bay westward across the lake. Line H passed north of Wild Horse Island and Cromwell Island. The Book G narrative indicates that the Line H documents were missing as of January 12, 1993.

References Cited

Silverman, A. J., Pevear, D. R., and Prahl, S. R., 1971, Bathymetry of Flathead Lake, Montana: unpublished. (URL: http://scholarworks.umt.edu/flathead/15/)

Simpkin, P., 2007, personal correspondence

Last Update: 4/2/2017 9:26 AM