Book E

Redisplayed Seismic Sections

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The seismic sections showing the redisplay of the data from the 1970 Wold-Crosby Flathead Lake reflection seismic survey were initially scanned at 600 dots per inch (dpi). The files were very large, and I reduced them to 300 dpi.

Line I was too long to fit on the scanner and was scanned into two files. The original redisplay for Line H is missing as discussed in the Book G narrative.

The timing lines on the redisplayed sections are at 100 ms intervals on most lines. Line Jw may be the lone exception in which the timing lines may be at 50 ms. The user should carefully check the timing lines on the respective scans of the field recordings and the redisplayed sections and check for consistency with the respective bathymetric profile and the Prahl bathymetry map.

No information exists on what, if any, analog data processing was applied to the field data as part of the redisplay process. Otis et al. (1977) indicate that only band pass filtering was available on the Wold-Friedel seismic system during their surveying in 1973 and 1974. The redisplay work for the Flathead Lake data is believed to have been done by Sidney Prahl based on an acknowledgement given by Wold (1982). In comparing seismic sections generated from the data digitized from the United States Geological Survey (USGS) archive tape with the redisplayed sections, the redisplayed sections appear to have had a high pass filter applied. Wold's (1976) report to the ONR suggests that he was experimenting with processing the data by playing back the tape at a speed faster than the recording speed in order to reduce processing time. Whether this was done on the Flathead Lake data is not known. Wold (1976) references both automatic gain control (AGC) and band pass filtering, but whether either of these processes was applied to the Flathead Lake data is not known.

The redisplayed data have the same orientation, e.g., west-to-east, south-north, and so forth, as the data in the original field recordings.

Most of the scans of the redisplayed data have a corresponding scan of an original field recording. The exceptions are noted in the Book C narrative. One should pay particular attention to the redisplay of Line G. The standard redisplay of the Flathead Lake lines was different for Line G, and that affected the output of the image to seismic traces ("dots to data") process. Two different redisplayed versions of Lines K, Q3, S, and T exist. The two versions could represent processing with different parameters, namely filter band settings. The USGS archive tape has seismic data on two tracks, and the original field recorder could record two tracks. Perhaps the two versions of these redisplays are tied to data on different tracks, and the different tracks were recorded with different gain or filter settings in the field.

The redisplayed data files in this book have undergone one more stage of image processing beyond the 600 to 300 dpi downsizing mentioned above. As part of the image to seismic traces

process that I developed in 2012, all of the images had to be rotated such that the timing lines were horizontal. The process employed is believed to have adjusted the images such that the timing lines are within 0.5º of horizontal. The file names in this book end with _redis_rot.jpg indicating that they are images of the originally redisplayed seismic sections rotated such that the timing lines are horizontal.

References Cited

Otis, R. M., Smith, R. B, and Wold, R.J, 1977, Geophysical survey of Yellowstone Lake: Journal of Geophysical Research, v. 82, p. 3705.

Silverman, A. J., Pevear, D. R., and Prahl, S. R., 1971, Bathymetry of Flathead Lake, Montana: unpublished. (URL: http://scholarworks.umt.edu/cgi/viewcontent.cgi?filename=2&article=1015&context=flathead&type=additional)

Wold, R. J., 1979, Marine geophysical instrumentation: Office of Naval Research, NSTL Station, MS.

Wold, R. J., 1982, Reflection seismic study of Flathead Lake, Montana, USGS Miscellaneous Field Studies Map MF-1433: US Geological Survey. (URL: https://pubs.usgs.gov/mf/1433/plate-1.pdf)

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Lankston, R. W., 2023, "E. Redisplayed seismic sections – narrative by Robert W. Lankston" in *1970 Flathead Lake Seismic Survey*. URL: https://scholarworks.umt.edu/cgi/viewcontent.cgi?filename=2&article=1003&context=flathead&type=additional

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I would suggest the same citation format and the same technique for capturing the URL of the supplemental files that form the heart of the content of this book. For the Line A redisplayed seismic section, specifically, the citation could look like:

Prahl, S. R., 1970, “E. Redisplayed seismic sections – Line A redisplayed seismic section” in *1970 Flathead Lake Seismic Survey*. URL: https://scholarworks.umt.edu/cgi/viewcontent.cgi?filename=0&article=1003&context=flathead&type=additional

In this case, the author is who processed the seismic data and generated the redisplayed sections, and the date is when the data were processed. The author of the files, other than my narrative, is listed after the book title on the ScholarWorks page, and the year of creation is listed in the Date field below the list of available files. Those author and date fields are ones that I set when I enter the metadata for the book.

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