Open Seismic Data with Scripts for Processing with Open Software

Karl Schleicher, University of Texas

There is a big gap between a functioning research prototype and a tested program. You learn a lot when you start processing field data. In industry, processing groups help the research and development groups. They provide data expertise, including selecting a suitable dataset, previous results, detailed parameters, partially processed data for input, and an eye to evaluate the new results. I have started to build a library of seismic field data with scripts for processing with open software. The scripts provide detailed processing sequences and parameters that can be used with or without modification. This library is freely available to accelerate testing and validation of new seismic algorithms.

The long term goal of the project is to provide multiple datasets for testing different research efforts (2d, 3d, land, marine, random noise, multiples, sampling, etc). The library might contain both field and model data, but I want to encourage the use of field data.

Previous open source processing instruction has addressed a wide range of training including basic unix, user environments, basic processing theory, and advanced scripting. Examples of the instruction material are the demos directory in the SU distribution, Seismic Data Processing with Seismic Un*x (Forel), and Geophysical Image processing with Seismic Unix (Stockwell). The library's focus is for basic processing scripts for a full processing sequence including loading, trace header creation, velocity filtering, velocity analysis, moveout, residual statics, stack, and migration. The library also provides field data access.

Most of the scripts have been developed for a land line from Alaska, 31-81. The data was obtained from a USGS web site and has been processed with seismic unix (SU). SA processing sequence has also been developed using Madagascar. The field data will be described and the processing results will be shown at the workshop. These data and scripts (SU and Madagascar) can be obtained in the Madagascar development distribution in the directory $RSFSRC/book/data/alaska. The processing scripts are still being developed.

Initial results have been produced on the Nankai deep water 2D data from the University of Texas and the University of Hawaii. These data were distributed with Seismic Data Processing with Seismic Un*x (Forel). Even more preliminary results have been produced on the Taiwan 2D marine line, also from the University of Texas and the University of Hawaii and distributed with Seismic Data Processing with Seismic Un*x. More data sets have been identified. The processing scripts and data will be loaded into the .../book/data portion of the Madagascar release.

The processing sequences currently used are intentional very basic. Each data set has encountered it's own set of problems. Alaska line 31-81 processed with SU is the most mature portion of the library. Line 31-81 is currently freely available. Other portions of the library will be installed as they become available.

In the future I want to continue to add new data sets to the library, compare results obtained from different processing packages, and upgrade package weaknesses