**Session 1 Exercise: Fundamentals**

*Preparation:*

1. Copy the data/Session1 directory to your work area.
2. Briefly look at the man page for the od command.

*SAC data files:*

1. cd to the data/Session1/sac directory
2. Start sac
3. Read the 3 data files in this directory (read MC1\*)
4. Run the listhdr command. Discuss
5. Point your web browser to: http://www.iris.washington.edu/manuals/sac/manual.html
6. Open a new terminal window and let’s look at these data files in a more primitive way that sometimes useful to know if all you get is read errors:
   1. od –A d –t c MC1.HHZ.2008.110.13.08.54 | more
   2. od –A d –f | more
   3. Let’s discuss the results. What went right and what went wrong? What is the basic structure of a SAC file?

*SEGY data files:*

1. Go to the segy directory. You should see files highresref.sgy, highresref.su, and highresref\_big.su. The first is the parent true blue segy tape image, the second is a Seismic Unix file that is one of many pseudo-segy formats, and highresref\_big.su is the evil twin of highresref.sgy in big endian byte order.
2. Let’s look at the segy tape image file and the SU file that was derived from it and relate it to the SEGY standard. Run these commands all in individual terminal windows:

od –A d –t d2 highresref.su | more

od –A d –t d4 highresref.su | more

od –A d –t f4 highresref.su | more

od –A d –t f4 highresref\_big.su | more

and for something closer to segy try

od –A d –t c highresref.sgy | more

We will work on this together with the aim of cracking this code.

*Miniseed files:*

1. Go to the miniseed directory.
2. Run: msdd Y12C.BHZ.2007.084.00.30.00 | more (This should show you how miniseed files are organized as a sequence of data packets separated by headers.)
3. Run: msdd –vv Y12C.BHZ.2007.084.00.30.00 | more

Compare this to:

od –A d –t c Y12C.BHZ.2007.084.00.30.00 | more

or any other binary word you want to choose to see the packets are made up of steim compressed data that has to be uncompressed when you read the data.

1. Run: miniseed2db Y12C.\* msdtest and then dbpick msdtest. You should see a beautiful seismogram from the TA.

*SEED files:*

1. Go to the seed directory
2. Run: msdd –vv sinz08.seed (msdd works on seed files reporting only on data blockettes).
3. For a last bit of fun run:

seed2db –respdir response –stagedir response/stage sinz09.seed sinz

1. Run: dbpick sinz
2. Anyone recognize this earthquake?
3. Keep these data. We will use them again later today.