Combining Seismic Hazard Files
Part I: WUS Background Sources

When the background or gridded hazard has been run for the WUS sources, the binary output files need to be combined with appropriate weights. These combine steps are performed in the script combine.grid.csh. This script runs the program hazallXL.v2.f several times. The input files to hazallXL.v2.f have to be binary files. For these background sources, the programs that write the input files to hazallXL.v2.f are hazgridXnga2.f and hazgridXnga3.f. These programs will write binary files if the first line of their input files has a 0 (zero) as the first field. This 0 is an instruction to perform calculations on a rectangular grid of sites and to write the results as a binary file. If this first field is greater than zero, the output files are ascii, and they cannot be combined with hazallXL.v2.f. The zip file combine.WUSgrid.zip contains all of the scripts and input files for Part I.

In order to combine various files successfully, several features of these files must be compatible. One obvious compatibility requirement is that the same grid of sites must have been considered. This grid does not have to cover the entire western United States, as in the attached input files, but does have to be the same region among all of the input files. Another requirement is that the same set of ground motions must have been sampled for each input file. A geotechnical requirement is that the same site condition must hold for each input file. Although this geotechnical requirement is important to honor, if the files do not have the same Vs30, the only consequence will be a warning message. It is always the user's responsibility to insure that the data being combined are fully compatible. The program hazallXL.v2.f will help him or her with this, but it does not and cannot check all possible compatibility issues.

There are some options in the cshell script, which was written for a Solaris operating system. One available option is to omit the deep background sources and only consider crustal source hazard. This option is invoked by entering the word "crustal" as argument 1 on the command line. If no arguments are included on command line, then all of the files corresponding to three spectral periods are expected to be available: PGA, 1-s SA, and 0.2-s SA. If any of these files are missing, an error message will be written and the combine process will not proceed. For the 2007-2008 USGS PSHA, there are typically 26 files per "run" in each gridded-source combine step, three of which correspond to deep-source hazard.

Another step in the background-source combine script is to interpolate the output files to a finer spatial sampling. For the WUS files, the original sampling is 0.1° in latitude and longitude, and the interpolation is to 0.05°. The output files of this step have "05" in their names to indicate that this interpolation step has taken place. A header record also contains this important information.