

High resolution seismic reflection profiling across the Shiroishi fault, northeast Japan

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We collected and processed shallow high-resolution seismic reflection data in order to resolve shallow structures and to understand structural linkage between active faults and folds recognized at ground surface and deeper, complicated fold and thrust structures along the Shiroishi fault, northeast Japan. We deployed more than 200 seismic channels, 10-Hz geophones, and Enviro-Vib (IVI, Inc) as a seismic source along about 5-km-long seismic line. Common midpoint stacking by use of initial velocity analysis successfully illuminates subsurface geometries of active fault-related fold to 1-1.5 two-way time. Detailed seismic reflection analyses including refraction and residual statics, migration, deconvolution, and time-space variant bandpass filters, and depth-conversion by use of stacking velocities enable to obtain subsurface depth section of these active structures. The high-resolution depth section shows that west-dipping thrust fault imaged in the section is consistent with the location of the base of the fault/fold scarp that deforms middle to late Pleistocene fluvial sediments.

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