Abstract. A method for synergizing the information on sedimentary layer thickness obtained from microtremor measurements with the 'ground truth' borehole measurement is proposed for the purpose of seismic hazard reduction in urban areas that requires high-resolution near-surface geologic information. Traditionally many boreholes are required to obtain detailed information of sediment layers, which is time consuming and costly and in many cases not affordable for research community. In order to reduce these constraints geostatistical data fusion of minimal borehole and more accessible microtremor surveys can be utilized to map the sedimentary layers at a high-resolution. Microtremor measurements can be conducted in city or suburban areas whereas traditional methods of explosive and/or vibrating sources would not be acceptable. An existing collection of borehole data is widely available in Beijing area; nevertheless, it is still not enough to obtain comprehensive, high-resolution sedimentary thickness maps. In the summer of 2007 we had collected microtremor measurements over 1,100 sites in Beijing area. The inferred sedimentary thickness from the horizontal to vertical spectral ratio (H/V) of the microtremor data can be used to fill the vast gaps between isolated point measurements of sedimentary thickness provided by the sparser borehole data. Data fusion will be accomplished by the geostatistical methods of variograms, cross variograms, and cokriging in order to produce an estimated sediment layer map. Additionally, conditional simulation will be utilized to enhance this estimation in order to provide an enhanced resolution sediment layer map for seismic hazard reduction in urban areas and other geophysics studies. This project is supported by the Ministry of Science and Technology of China with Project No. 2006DFA21650.