

## Relationship between crustal heterogeneities and seismogenic faults

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We found a close relationship between crustal heterogeneities and large crustal earthquakes in Japan. Most of the large earthquakes occurred in or around zones of low seismic velocity revealed by seismic tomography. The low-velocity zones may represent weak sections of the crust. Along the volcanic front and in back-arc areas the crustal weakening may be caused by active volcanoes and

magma chambers. In the forearc areas, fluids are detected in the earthquake source zones, which may have contributed to the crustal weakening and the rupture nucleation. The fluids may be related to the dehydration of the subducting Philippine Sea slab. These results indicate that large crustal earthquakes do not strike anywhere, but only anomalous areas that may be detected with geophysical methods.