

## Digital terrain analysis of sea-land combined data on the Outer Zone of Southwest Japan

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Geomorphological studies have been done in predominantly land areas, and usually have been treated separately: divided into either land or seafloor. The authors have been studying land topography, however, many parts of the Japanese archipelago were formed by lifting of the seafloor associated with plate sinking in trenches. The Outer Zone of Southwest Japan, which is the object of this study, is on plate boundaries.

Recently spatial resolutions of seafloor DEMs have become enlarged, and a few subsurface structure data have been published. Therefore the authors thought that we should visualize and analyze the sea-land combined data.

In this study, we analyzed drainage networks, profiles, and terrain types of Southwest Japan using a 500-m DEM which was a mosaic of land elevation by GSI and seafloor elevation by the Japan Coast Guard. Moreover, we visualized land topography and other data, i. e., seismic tomography data (Matsubara and Obara, 2011), distribution of seismic intensity, and plate boundary data that were published on the Internet. The visualization shows inhomogeneous structure of velocity below Japanese islands and a clear hot section leading out from deep underground to Osaka Bay.

Land and shelf edges are quantitatively similar to each other in topography. However, there are almost no steep slopes with high valley density on the seafloor in contrast to land surfaces. Instead of high valley density slopes, long large steep slopes as in Quaternary volcanos, such as Mt. Fuji, are widely distributed on the deeper seafloor. In addition, steeper parts of long large slopes are distributed around active faults in land, inner trench areas and outer ridges on the seafloor, in addition to tops of volcanos.

This study was carried out within a framework of "Mapping of large landslides based on the sea-land combined terrain classification: case study of the overall Outer Zone of Southwest Japan including the Nankai Trough" which was a theme in '2014 Collaborative Research with the Disaster Prevention Research Institute, Kyoto University'. We would also like to thank the Japan Coast Guard who provided the 150-m and 450-m Geographical Feature Meshes Data of Southwest Japan.

### References

Matsubara, M. and Obara, K. (2011): The 2011 Off the Pacific Coast of Tohoku earthquake related to a strong velocity gradient with the Pacific plate, *Earth Planets Space*, 63, 663-667.

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