

Estimation of tectonic erosion along the Japan Trench on the basis of the tectonics in central Hokkaido

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Tectonic erosion along the Japan Trench was estimated on the basis of the tectonics of central Hokkaido. Quaternary tectonic deformation between western Hokkaido, which belong to the NE Japan block, and eastern Hokkaido on the North American Plate is not so strong rather than that of the eastern margin of the Japan Sea. This means that no major differential motion has occurred between them. The westward motion of the NE Japan block, caused by the Philippine Sea Plate motion, can be calculated if we assume the tectonic erosion along the Japan Trench. When we assume that there is no erosion, westward motion of the western Hokkaido is faster than that of the eastern Hokkaido. This implies that extension tectonics, such as normal faulting and/or rifting, would be expected along the central Hokkaido. Therefore, this non-tectonic-erosion model is rejected because no such geologic deformation is observed. In contrast, if we assume that all component of the westward motion of the Japan Trench is cancelled by the tectonic erosion, E-W contraction does not occur in NE Japan except for central Hokkaido. Thus the rate of the tectonic erosion to the westward motion of the Japan Trench should be limited as both western and eastern Hokkaido is moving at a same velocity. As a conclusion, 38.7% of the westward motion of the Japan Trench is cancelled by the tectonic erosion along the Japan Trench, which is good agreement with the previous estimate (40%).