

Pleistocene tephrostratigraphy off Kumano: understanding the sedimentary tectonic evolution of Kumano subduction zone

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Stratigraphic correlation of marine-tephras recovered by IODP NanTroSEIZE and other conventional corings in Kumano subduction zone is studied. Kumano area is located within a widespread-tephra falling zone from the southwest Japan. This situation provides a unique opportunity to study distributions of widespread tephras between Kinki and Kanto districts. Coherent sedimentary sequence on the accretionary prism cored by Chikyu is characterized by a frequent tephra occurrence. It could be an excellent data set to study tephra occurrence up to 2 Ma. Refractive index of glasses and mineral assemblage are measured to identify the characteristics of the tephra layers. Results of correlation between studied and previously reported based on these data show distinct spatiotemporal distributions of tephra layers in 1) Kumano forearc basin, and 2) upper landward. 1) A general sedimentation pattern estimated from the tephra stratigraphy is that the slower in the southern and higher in the northern Kumano forearc basin. This pattern is consistent with the sedimentary layer structure inferred from the seismic profile. No identification of younger tephra than Sanbe-Ukinuno (Suk: ca. 20ka) in the southern Kumano forearc basin. Suk layers occur at the shallow depths within a few-m below sea surface in the southern Kumano forearc basin. On the other side, sediments in the northern Kumano forearc basin involve the younger tephra of Kikai-Akahoya (K-Ah: 7.3ka). 2) At IODP site C0001 which is located at the upper landward slope, a series of tephra layers was recovered. The shallowest (3.91-m) tephra found at C0001 is Atatorihama (Ata-Th: ca 240 ka). Subsequent downward tephra layers (3.91-100-m) are well correspondent to early Pleistocene tephras reported from Kinki and Kanto districts. As around 3.91m a significant physical property shift is observed, it is considered that the younger sediment than 7.3 ka is eroded. A submarine landsliding around C0001 can account for this sedimentation pattern.

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