

Seismic stratigraphic analysis of Pliocene to Pleistocene sedimentation and tectonics in the eastern Nankai Trough forearc basins

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Seismic sequence stratigraphic facies distribution analysis was conducted in the eastern Nankai Trough forearc basins to model the relationship between sedimentation and basin tectonics in a forearc setting. Total thirty-two 2D seismic sections, 3D seismic data and well data such as cores and well logs were used for depositional sequence identification in the Upper Pliocene to Pleistocene strata. As a result of reflection termination recognition, total seventeen depositional sequences were identified as onlap surface-bounded stratigraphic packages. The Upper Pliocene to Pleistocene interval in seismic sections show six types of seismic facies, indicating the proximal part of mid fan, mid fan, outer fan of a submarine fan system, debris flow and basin floor sediments. According to facies maps created by plotting seismic facies, there were several major sediment supply systems from the northern continental slopes, through which multiple submarine fans were developed in the eastern Nankai Trough forearc basins. The type, shape and distributions of the submarine fans changed through time, possibly being affected by tectonic forces from the Nankai subduction zone. At the early phase of Plio- to Pleistocene Kakegawa Group deposition, relatively coarse submarine fans were developed widely without major topographic control. At the middle to late phase of Kakegawa deposition, depositional areas were restricted to the Kumano basin, Enshu Trough and outer ridge zone of the forearc basins. At the early phase of overlying Middle Pleistocene Ogasa Group deposition, depositional areas were also restricted to offshore Atsumi and the outer ridge zone, but finally widened in the whole forearc basins, except Shima Spur area. Atsumi Knoll area is highly deformed due to uplift of Atsumi Knoll at the latest phase of Ogasa deposition.