



Plio-Quaternary seismic stratigraphy and depositional history in the Ulleung Basin, East Sea

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Analysis of multi-channel seismic data from the Ulleung basin reveals that Plio-Quaternary sequence in the area consists of nine stacked sedimentary units bounded by erosional unconformities. On the southern slope, these units are acoustically characterized by chaotic seismic facies without distinct internal reflections, interpreted as mass-transport deposits. Toward the basin floor, the sedimentary units are defined by well-stratified facies with good continuity and strong amplitude, interpreted as turbidite/hemipelagic sediments. The seismic facies distribution suggests that deposition of Plio-Quaternary sediments in the area was controlled mainly by tectonic effects associated with sea-level fluctuations. During Pliocene, sedimentation was mainly controlled by tectonic movements related to the back-arc closure of the East Sea. The back-arc closure that began in the Miocene caused compressional deformation along the southern margin of the Ulleung Basin, resulting in regional uplift which continued until the Pliocene. Large amounts of sediments, eroded from the uplifted crustal blocks, were supplied to the basin, forming Unit 1 which mainly consists of mass-transport deposits. During the Quaternary, sea-level fluctuations resulted in stacked sedimentary units (2 to 9) consisting of mass-transport deposits, formed during sea-level fall and lowstands, and thin hemipelagic/turbidite sediments, deposited during sea-level rise and highstands.