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Seismic interpretation of the post-Middle Miocene section of the northeastern Northern South Sea Yellow Basin, Yellow Sea

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The Yellow Sea is a very shallow (< 90 m), semi-enclosed epicontinental sea, lying between China and the Korean Peninsula. The Yellow Sea has undergone gradual, regional subsidence since the Middle Miocene when the major plate reorganization in East Asia led to regional uplift and subsequent erosion in many parts of the marginal basins of the western Pacific, including the Yellow Sea. In this study, we analyzed about 2500 km of 2-D multi-channel seismic data from the northeastern part of the Northern South Yellow Sea Basin to investigate the post-Middle Miocene geologic history of the area. We identified and mapped the Middle Miocene unconformity (MMU) and two horizons (H1 and H2) which are correlatable over much of the area. H1 and H2 were inferred to be of the early Late Miocene (ca. 10 Ma) and of the late Late Miocene (ca. 6.7 Ma), respectively, assuming a constant sediment accumulation rate. MMU forms the top of the basement except for the southwestern corner of the area and is interrupted by numerous volcanic bodies, suggesting active post-Middle Miocene volcanism. The volcanic bodies are oriented largely parallel to the basement faults. H1 and H2 are also affected by volcanic bodies in the northern part of the area, suggesting continued volcanism until the late Late Miocene. The depth of MMU increases southwestward from about 250 m to over 750 m, indicating progressive tilting (i.e. differential subsidence) of the basement toward the depocenter in the southwest. The depths of H1 and H2 increase west- and southwestward from about 200 m to over 450 m and from about 150 m to over 300 m, respectively. Detailed seismic facies were not analyzed due to poor data quality; nevertheless, continuous reflectors, suggesting uniform and thus marine deposition, appear to increase upward and northeastward. This, together with the amount of subsidence estimated from the depth of MMU, strongly suggests that subsidence has been dominant in the area over the global sea-level fall (about 100 m) since the Middle Miocene, causing accelerated rise of relative sea level.