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Surface response to deep geodynamic process of multiple tectonic regimes: Geochemical record of early Mesozoic sedimentary rocks in NE North China Craton

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The early Mesozoic tectonic evolution of the northeast Asian continental margin is mainly controlled by the Paleo-Asian Ocean and Paleo-Pacific tectonic regimes. However, the transition time of two tectonic regimes and onset time of subduction of the Paleo-Pacific plate are still controversial. The earth's surface system with bio-environment-climate as the core collaboratively records deep geodynamic process of plate subduction. Here, this paper provides an early Mesozoic case in the northeastern North China Craton (NCC). The early Mesozoic variations of paleoclimate and paleoenvironment in the northeastern NCC were tracked by geochemical record of sedimentary rocks. Combining with variation of crustal thickness and detrial zircon age distribution patterns, the connection of early Mesozoic climate and environment and tectonic evolution of the northeastern Asian continental margin is revealed. **Early-Middle Triassic** paleoclimate is arid and cool, and sedimentary environment show meandering river facies. The closure of the Paleo-Asian Ocean result in the rapid uplift and enhancing continental weathering; **Late Triassic** paleoclimate changes as the transition of arid-humind, and sedimentary environment show river-lacustrine and volcanic facies. The transition of the Paleo-Asian and Paleo-Pacific tectonic regimes makes crustal activity tend to moderate, sediments of recycling and mature are deposited in the passive continental margin; **Early Jurassic** paleocliamte changed obviously and become humid and warm condition, and sedimentary environment is characterized by swamp-floodplain-river facies. The subduction of the Paleo-Pacific Plate caused volcanism in northeast Asian continental margin, driving the greenhouse climate related to Toarcian Oceanic Anoxic Event (~183 Ma) in the northeastern NCC.