

## Beppu Bay stratigraphy records the timing of human-induced planetary-scale biological and environmental shift at the beginning of the Anthropocene

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The definition of the lower boundary of Anthropocene requires a global stratotype section showing a human-induced planetary-scale biological and environmental shift. However, such stratotype remains unclear. Here we present multiproxy records showing biological and environmental changes for the last multi-century or millennia using the sediment core samples from anoxic coastal marine basin, Beppu Bay, Japan. Biotic marker records showed an abrupt biological change as seen in algal communities due to eutrophication in 1960s, early Great Acceleration, which was unprecedented over the last 670 years. The remarkable biological changes reconstructed from Asian oceanic sediment imply that intensified coastal marine ecosystem degradation which started in Europe in 18th century extended over the northern hemisphere at the early Great Acceleration. Our results provide a geological evidence of the human-induced planetary-scale biological and environmental shift at the lower boundary of Anthropocene.

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