

Geochemical detection of the historical tsunami deposit

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Historical records reveal that the Sendai and Ishinomaki plains were devastated by the AD869 Jogan and AD1611 Keicho tsunamis, and that the AD1454 Kyotoku tsunami might have also affected these plains. Radiocarbon dating is not straightforward for estimating ages in the medieval period, and thus the discrimination between the tsunami deposits left by the AD1611 and AD1454 events is difficult. Another issue is that the evidence of minor tsunamis might be hard to decipher in the geological record. Geochemistry is a useful tool which can help solve these issues, and its value has been increasingly recognized in paleo-tsunami and paleo-environmental research. Multi-proxy geochemical analyses in particular enable a more accurate interpretation of the geological record. In this study, we analyzed a core excavated from Iwanuma City, Miyagi Prefecture, using non-destructive X-ray fluorescence (ITRAX), as well as TC, TOC, TN and C/N ratio to identify the possible tsunami deposits and to reconstruct the paleo-environmental changes during the last thousand years, in combination with information from historical documents and diatom assemblages. We detected geochemical signatures that suggest a seawater inundation event, possibly a tsunami or storm, beneath the possible AD1611 tsunami deposit.

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