

## Geochemical identification of the tsunami deposit using machine learning machine learning techniques

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Tsunami deposit is a direct evidence of inundation area of past tsunamis. A large number of publications have been written about the diagnostic signatures and identification criteria for past tsunamis, including sedimentological, micropalaeontological evidences. However their identification is still difficult because all criteria is neither necessary condition nor sufficient condition due to various origin, mechanism and temporal variation of tsunami deposits. Geochemical discrimination is now recognized as other useful proxy which dose not depend on the researcher's subjectivity, especially in the case that other proxies can not be used. Especially, geochemical indicator is suggested to be useful in identification beyond the limit of recognizable sand deposition. In this study, we established the criteria for geochemical discrimination of 2011 Tohoku-oki tsunami deposits and their background marine sediments using machine learning techniques. For 18 analyzed elements, several tens of elemental combinations show the discrimination rates higher than 99%. By applying the criteria to past tsunami deposits in the Sendai Plain, we discuss the validity and effectiveness of the method.

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