

## Identification of tsunami deposits using organic markers

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Geochemical analyses of tsunami deposits are becoming standard and are used in almost every study. However, only inorganic proxies are typically studied. Recent studies that developed and broaden geochemical methods to investigate tsunami deposits (e.g., Szczucinski et al., 2016) and illustrate the importance of information from biomarker analyses (e.g., Shinozaki et al., 2015). These studies indicated that organic geochemistry can be used for the differentiation between marine and terrestrial matter, indicating a potential source of a deposit. Organic proxies also have the advantage of remaining longer in the sediment than inorganic proxies, which can be leached out by groundwater or rain.

The 2011 Tohoku-oki tsunami inundated as much as 4.5 km inland and had run up heights of up to 40 m. Samples of sandy tsunami deposits from Sendai Plain, Samenoura Bay, and Oppa Bay (Japan) were collected and analyzed using gas chromatography-mass spectrometry (GC-MS) to search for natural compounds (biomarkers) and anthropogenic pollutants (anthropogenic markers). Natural compounds substances, such as fatty acids and n-alkanes, and anthropogenic compounds (e.g., polycyclic aromatic hydrocarbons and pesticides) were identified and quantified. Further, the two different compound types (natural vs. anthropogenic) were evaluated for their usefulness in identification of deposits from extreme flooding events. The analyzed chemical compounds and their diagenetic transformation products were distinctly different for the pre-tsunami, the tsunami and the thin post-tsunami eolian deposits.

The preliminary results of this study point out the utility of organic indicators for the identification of extreme flooding events (like tsunamis), particularly for historic events.

### References

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