

Preservation states monitoring of the 2011 Tohoku tsunami sediments, as determined by geochemical and rock magnetic analyses

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Near-shore marine sediments deposited along island arcs preserve evidence of past disaster events such as tsunamis. A tsunami occurred on 11 March 2011 off the Pacific coast of Tohoku, Japan, and the event is likely preserved in marine sediments. This study aims to constrain the distribution of tsunami deposits and its preservation states at Sendai Bay, located in the Tohoku area, by geochemical and rock magnetic analyses. Sediment samples from Sendai Bay were collected at four stations, located east of the epicenter of the 2011 Tohoku earthquake, between 2011 and 2015. The intensities of IRM unblocked at 500-700°C in soft component is greater in the 2011 samples from offshore stations S-4 and S-5, suggesting the presence of material with a higher Curie point. However the increase of soft component intensity is not found in the 2013-2015 samples. Magnetic grain size parameters, M_r/M_s and H_{cr}/H_c , show a similar pattern in 2011-2012 samples, while the trend is not recognized in 2013-2015 samples. Cr content increased in the sediment samples just after the 2011 Tohoku tsunami, but it decrease in the 2013-2015 samples. It is suggested that sediments from the inner bay and/or coastal area were transported and redeposited by the 2011 Tohoku tsunami, and removed after 2013.