

Accepted Manuscript

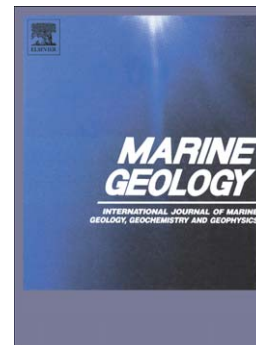
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PII: S0025-3227(15)00006-7
DOI: doi: [10.1016/j.margeo.2015.01.004](https://doi.org/10.1016/j.margeo.2015.01.004)
Reference: MARGO 5245

To appear in: *Marine Geology*

Received date: 26 May 2014
Revised date: 9 November 2014
Accepted date: 8 January 2015



Please cite this article as: Hüpers, A., Ikari, M.J., Dugan, B., Underwood, M.B., Kopf, A.J., Origin of a zone of anomalously high porosity in the subduction inputs to Nankai Trough, *Marine Geology* (2015), doi: [10.1016/j.margeo.2015.01.004](https://doi.org/10.1016/j.margeo.2015.01.004)

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**Origin of a zone of anomalously high porosity in the subduction inputs to Nankai
Trough**

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Abstract

One poorly understood feature of the subduction inputs to the Nankai Trough subduction zone (SW Japan) is a stratigraphic interval with an anomalously high porosity zone (HPZ), which is up to 240 m thick and located within the clay- and volcanic ash-rich Shikoku Basin facies. To investigate the origin of their peculiar physical properties, we integrated logging-while-drilling (LWD) data, shipboard density measurements, and visual descriptions of core samples recovered from four drill sites of the Ocean Drilling Program and Integrated Ocean Drilling Program. We combined those observations with scanning electron microscopy (SEM) and laboratory consolidation tests on both HPZ samples and artificial mixtures of ash (glass shards) + smectite and vesicular pumice + smectite. LWD data indicate that the HPZ mudstones have a large proportion of dispersed volcanic ash (~20-30%). The consolidation tests show that the rate of porosity loss with increasing effective stress (consolidation behavior) is consistent among HPZ specimens and matches artificial mixtures containing up to 60% volcanic material. However, absolute values of porosity remain higher for HPZ samples compared to artificial mixtures, so processes in addition to the mechanical effects of

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