



Knowledge gaps in gas-hydrate assessment: theoretical considerations and practical implications

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Gas-hydrates have been studied as a proxy of the global climate change, geo-hazard assessment or derived heat-flow. The main variables controlling the gas-hydrate stability zone (GHSZ) are gas-composition, geothermal gradient, pressure (bathymetry), and seafloor temperature. Two sites (Antarctica and western European margins) have been selected for the calculation of the theoretical base of the gas-hydrate stability zone (GHSZ) applying the methodology of León et al (2009) with public and free oceanographic data (<http://odv.awi.de>).

The results of the calculations in both sites point to the fact that the density and reliability of these free and public data are valid only for regional studies. In areas where the seafloor temperature is well known such as the Mediterranean Sea or the Gulf of Cádiz, pockmarks and landslides structures match with the theoretical base of the GHSZ. In other areas with low density of data (Antarctica and west Galician and Bay of Biscay margins) a precise geothermal gradient model has not been able to be produced nor has it been possible to take the undercurrents influence over seafloor into account in the GHSZ assessment, the uncertainty is bigger and a clear correlation between the base of GHSZ and the geological and geophysical features (BSR, pagoda-structures, pockmarks or submarine landslides) has not been observed.

The lack of a precise, available (free access) and continuous knowledge along the continental margins of the oceanographic variables controlling the base of GHSZ prevents accurate hydrate derived assessments and thus the necessary input for a complete climate model and a correct natural risk assessment. Therefore we conclude on the need of a pan-European gas-hydrate data infra-structure and the addressing knowledge gaps in the hydrate assessment in the European continental margin.

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References:

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