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Gas hydrates and gas charged sediments in the Romanian part of the Black Sea

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Black Sea is one of the most studied basin in the world regarding the gas hydrates presence and their influence against the slope stability. In the Black Sea was first time in the world reported the sampling of this special compound made up by gases (mainly methane) and water, in special circumstances of pressure, temperature and salinity, to mention the most important parameters that control the formation/dissociation of this type of compound.
The methane hydrates in the Romanian part of the Black Sea are formed and preserved in the area of the Danube Deep Sea Fan - DDSF, where the architecture of this sedimentary edifice hosts enough organic matter that is micro-biologically transformed to methane and then accumulated as methane hydrates. These gas hydrates are accumulated in layers below seafloor at depths in general between 200-300m, but in special circumstances could be much shallower and possible to be sampled by gravity or piston corers.
GeoEcoMar started to study the gas hydrates presence in this part of the Black Sea, back to mid 2000's in the framework of a national programme called MENER. At the end of the project two main areas have been identified to host methane hydrates, on a surface of about 2754.6 km2. A quantity of approximate 6.945*108 m3 of pure metahne hydrates has been estimated to be hosted in the Romanian part of the Black Sea. A subsequent (2007) national project accomplished by GeoEcoMar started to study the continetal slope stability in the area of methane hydrates accumulations and the conclusion was the slope is in general stable, but locally are areas that displays features specific to former, modern, instabilities.
More recently, in 2018 in the framework of the Core Research Programme (project PN 18160302) and then continued in 2019 (project PN 19200301), we started to study the gas escapes close to the area where methane hydrates accumulations become unstable, and to estimate their capability to reach the atmosphere and thus to contribute to the global warming. Until now the results confirm the former studies (as Crimea project) that none or very few metane reach the atmosphere, being biologically processed in the water column.
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