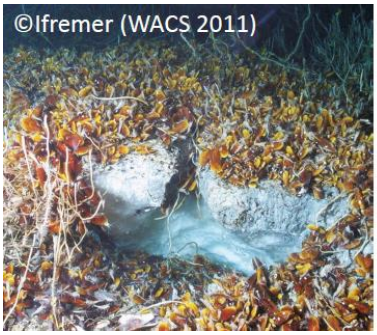
Key Messages from Conference

Gas Hydrate and Offshore Geohazard

22 June 2017, European Parliament

This document summarises the discussion from the SEARICA science briefing "Gas Hydrate and Offshore Geohazard" on 22 June 2017, hosted by MEP Gesine MEISSNER, President of the Intergroup and MEP Ricardo SERRÃO SANTOS, Vice-Chair for Marine Knowledge.

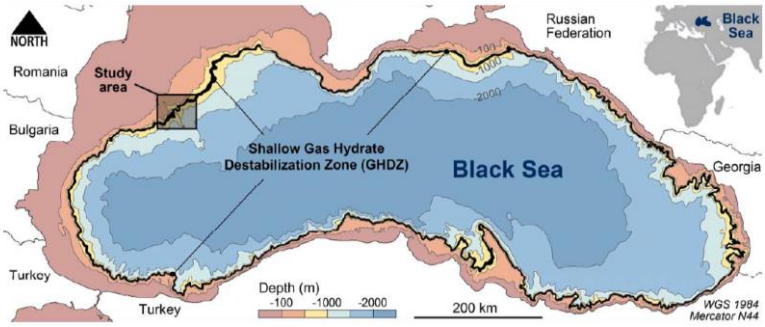


Marine gas hydrates are ice-like solids stored in continental margins and considered as the largest reservoir of methane, a potent greenhouse gas. They are found beneath vast regions of the ocean floor, in sediments of lakes such as Lake Baikal and both offshore and onshore permafrost regions of the Arctic.

Scientists have found that gas hydrates play a major role in the instability of slopes around the world's ocean margins as they change the strength of slope sediments and may trigger large submarine landslides and tsunami. It is recognized that both freezing and thawing as well as sea level changes may increase the number of landslides and tsunamis. A recent example off NW Greenland shows that such events are fast, powerful and devastating to coastal communities. Ocean warming and the change of pressure, for example during continuous deglaciation of Greenland, could also trigger the dissociation of hydrates and favour the release of methane into the atmosphere, and further contribute to powerful greenhouse gas increases in the atmosphere and thus global warming.

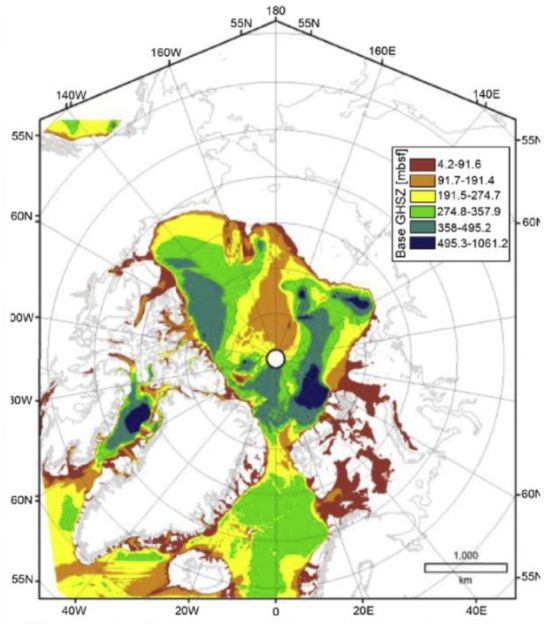
Offshore geohazards impede the development of blue economy and pose threats to ecosystem functioning. While resource exploration moves further offshore, it is essential to improve the tools and knowledge for identifying risks and set out a strategy for hazard mitigation.

The four speakers urged **European Commission to invest research on hydrate-hazard research to better understand the tipping points of frozen methane reservoirs and the dynamics of gas hydrate systems, as well as their links with the hazard development as well as consequences such as the tsunami.** Multidisciplinary and long term studies are indispensable in order to characterize in details the complexity of hydrate systems and determine the risks of slope instability and methane leakage (impact to seabed ecosystem) associated to hydrate dissociation.

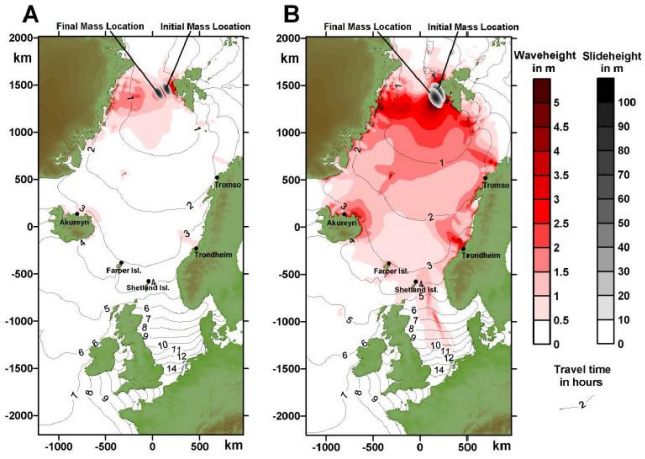


Riboulot *et al.* (2017)

Research from the Black Sea demonstrated that extensive gas hydrate dissociation may occur in the future due to recent and forthcoming **salt diffusion within the sediment which will destabilize gas hydrates** by reducing the extension and thickness of their thermodynamic stability zone in a region covering at least 4000 square kilometres.



The map shows the Gas Hydrate Stability Zone (mbsl: m below sea level) in the Arctic region. **The Arctic region is a strategic research area where global warming effect is amplified by the powerful greenhouse gas methane influenced by the dynamics of the gas hydrate systems.** New shipping routes connecting Asia and Europe cross directly above sensitive gas hydrate fields where major gas blow out craters exists on the seabed. **We need to monitor their dynamical behaviour for securing safe shipping routes in the future.**



Berndt *et al.* (2009)

Landslides on continental margins have been shown to trigger large tsunamis that threaten coastal communities and offshore infrastructure. It is therefore important to **assess the processes the likelihood and recurrence interval as well as the size of tsunamis that can be triggered on Europe's continental margins.**

Other points discussed:

- Coordinated technology efforts at European level, such as drilling programme and cable observatories
- Slope instability study
- Marine biodiversity at methane seeps

Speakers:

- Dr. **Nabil SULTAN**, Ifremer, France (French Research Institute for Exploitation of the Sea)
  Offshore gas hydrate decomposition: natural processes versus external influences
- Prof. **Jürgen MIENERT**, CAGE, Norway (Centre for Arctic Gas Hydrate, Environment and Climate)
  Gas Hydrates - real time challenges for ocean industries and shipping
- Prof. **Christian BERNDT**, GEOMAR, Germany (Helmholtz Centre for Ocean Research Kiel)
  Hydrate generated overpressure causing submarine landslides
- Dr. **Umberta TINIVELLA**, (National Institute of Oceanography and Experimental Geophysics)
  Offshore gas hydrate in Polar Regions: a challenge to face oceanic warming