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SEAGAS: A Brazilian-European project to compare gas hydrate systems on the Atlantic and Mediterranean ocean margins

Daniel Praeg^{1,2}, João Marcelo Ketzer¹, Sébastien Migeon², Tadeu dos Reis³, Cleverson Silva⁴, Vikram Unnithan⁵



¹Instituto do Petróleo e dos Recursos Naturais do PUCRS, Porto Alegre, RS, BRASIL

²Géoazur (UMR7329 CNRS), Valbonne, Cote D'Azur, FRANCE

³Universidade do Estado do Rio de Janeiro, Faculdade de Oceanografia, Brazil

⁴Universidade Federal Fluminense, Department of Geology, Niterói – RJ, Brazil

⁵Jacobs University Bremen, GERMANY



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Marie Skłodowska-Curie Actions (MSCA)



MSCA-GF-SEAGAS Objectives

Research Objective

1st comparison of gas hydrate dynamics on ocean margins that undergo different forms of climate forcing: open Atlantic margin of Brazil and semi-enclosed Mediterranean Sea

Training Objective

To diversify the competencies of the researcher and the two hosts, through joint research activities addressing shared research interests

Strategic Objective

To stimulate the development of future projects involving Brazilian and European scientists in mutually beneficial research activities

MSCA-GF-SEAGAS (2016-2019)

Strengths in marine geochemistry **Strengths in marine geology & geophysics**

Shared interests in building capacity in gas hydrate research

Gas Hydrate – Ice that Burns

Formation dependent on :

- pressure (higher)
- temperature (lower)
- a source of gas

Found in :

- areas of permafrost
- water depths >300 m
- mainly on continental margins (natural sources of gas)

Global gas hydrate locations

Organic carbon in the earth

Gas hydrates	10,000	10 ¹⁵ g
Other	500	
Peat	830	
Land biota	830	
Dissolved organic matter	980	
Soil	1,400	
Recoverable and non-recoverable fossil fuels (coal, oil, natural gas)	5,000	

Submarine gas hydrate stability zone (GHSZ)

GHSZ dynamics:

- thickens/thins over time, with changes in sea level (pressure) and water temperature
- release of gas and water may trigger submarine landslides (and more gas release)

SEAGAS Study Areas and Project Structure

Gas Hydrate Occurrences on the Atlantic-Mediterranean margins

SEAGAS study areas

- Nile fan (enclosed sea)
- Amazon fan (open Atlantic)
- Rio Grande cone (open Atlantic)

Project structure

- Numerical modelling of gas hydrate stability to guide interrogations of datasets held by hosts on the Brazilian and Nile margins
- generate hypotheses to test through the acquisition of new data, during a joint research campaign to the Nile or Amazon deep-sea fans

Source: USGS Gas Hydrates Project

SEAGAS conceptual framework : first comparison of gas hydrate systems on margins that have undergone different forms of glacial-interglacial (10⁴ yr) climate forcing

Open ocean (Norwegian margin)

Mediterranean Sea (Nile margin)

Expected changes in gas hydrate stability for a post-glacial rise in both sea level and bottom water temperatures

Changes on upper slope **Basin-wide changes**

MSCA Opportunities for Researchers

Where to find more information

- Website **MSCA** : <http://ec.europa.eu/msca>
- H2020 Participants Portal : <http://ec.europa.eu/research/participants/portal>
- Euraxess Links Brazil : <https://euraxess.ec.europa.eu/worldwide/brazil>
- CONFAP/FAPs: "Guidelines for the preparation of research proposals in collaboration with proposals submitted to EU Horizon 2020 (<http://www.fapesp.br/9775>)"

HORIZONTE 2020

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SEAGAS proposed French-Brazilian campaigns

Aim : to test hypotheses on gas hydrate dynamics through the joint acquisition of multi-disciplinary data (geological/geochemical/geothermal/geotechnical/geophysical)

Proposals submitted to French national ship-time programme

- Nile fan - SEAGAL**
Submitted 09/2016 by S. Migeon (, ranked top priority, decision on vessel scheduling expected 2018-2019)
- Amazon fan – AMARYLLIS**
Submitted 09./2016 by A. Govein (CNRS), ranked second priority; resubmitted 09/2017 (for 2019-2020)

Scientific drilling proposal in preparation - IODP

- Amazon fan - submission led by UFF planned for 2018, campaign possible in 2019-2020**

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