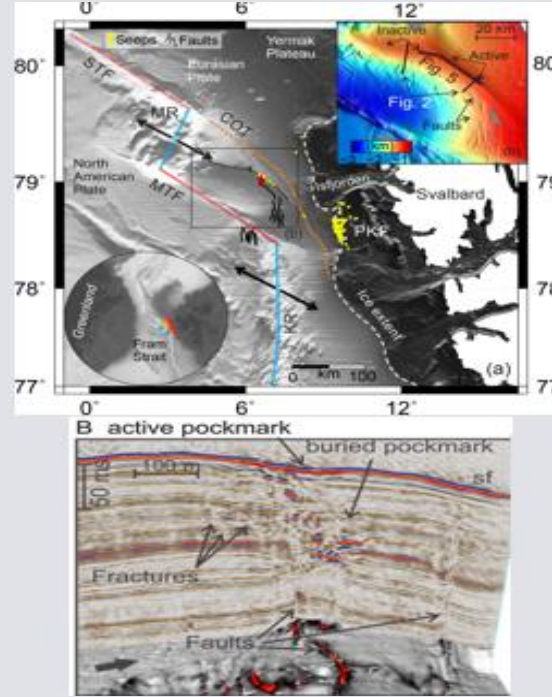


Time Constraints on Seepage Through Fractured Regions on the Vestnesa Ridge off the W-Svalbard Coast

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Vestnesa Ridge field information

Seafloor depth	~1210 mbsl
Ridge extent	~100 km long
Seafloor pressure	12.32 MPa
Seafloor temperature	272.45 K
Geothermal gradient	82 K/km
Pockmark seep area	200m x 200m
Base of hydrate stability	192 mbsf
Free gas below the hydrate layer	



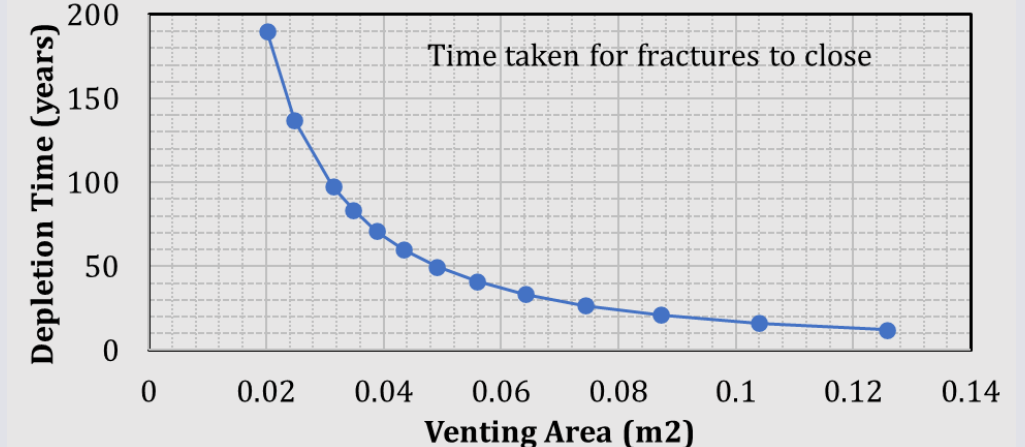
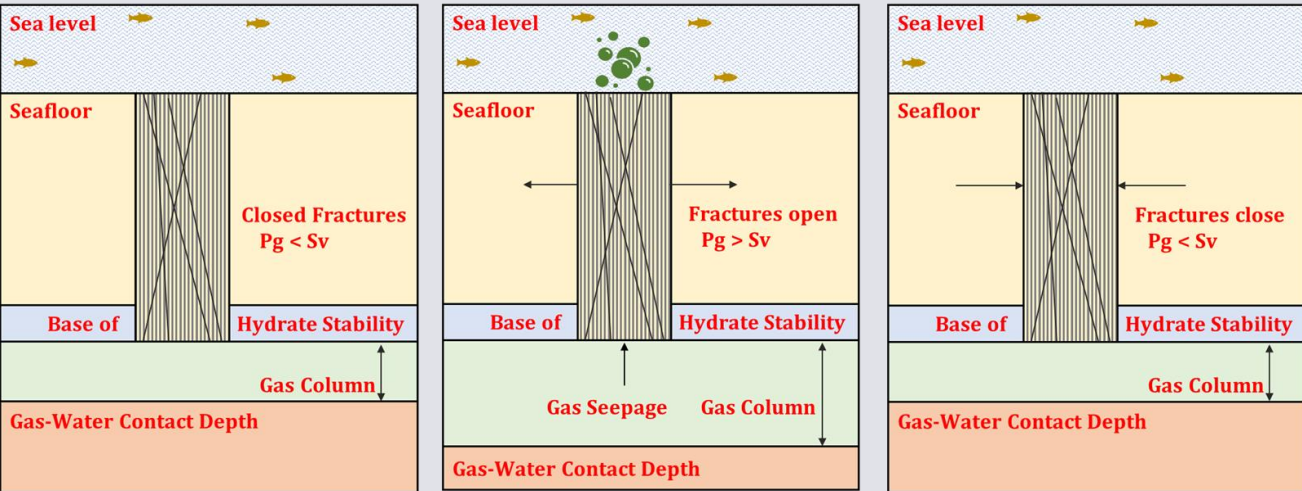
Key Findings

- ❖ Pressure required to open fractures = **1.09 MPa**
 - 89m gas column below hydrate layer with saturation > 0.27
- ❖ **8632 tons** of methane released before fractures close
 - Gas flux/fracture = 0.9 kg/year. 1mm fracture, 1m spacing

Time taken for methane to reach seafloor

Gas flux through fractured regions	64 Days
Advective conditions	12.3 years
Convective-Diffusive conditions	4700 years
Diffusive conditions	34000 years

Conceptual Model



Accumulation of gas; Fracture opening, methane seep; Fractures close;