

Thesis Title	Influence of fluid circulation on sedimentary diagenesis following the Mayotte eruption
Contract type	PhD thesis
Department/Office	Department of Ressources and deep sea ecosystems department
Duty station	Brest, France
Date of issue :	EDSML - Lucie Pastor (Ifremer-Brest), Christophe Rabouille (LSCE-Gif sur Yvette)
Doctoral School Thesis supervisor Co-supervisors	
Reference (HRD)	L. Pastor HDR 2021 ; C. Rabouille HDR 2003

The Institute and the recruiting department

The Department of Physical Resources and Deep-sea Ecosystems (REM) tackles scientific and technological challenges. Its research involves the study of the seafloor and the sub-seafloor, the geological evolution of continental shelves, past climate variation, geological risks, biodiversity and the dynamics of deep-sea ecosystems including biogeochemistry and the interaction between the biosphere and the geosphere. The student will be hosted in the deep sea environment laboratory (LEP) specialized in deep sea ecosystems.

Summary

Since May 2018, the Mayotte Island has been facing an unprecedented seismic-volcanic crisis which gave birth to a new submarine volcano in the east of the island. In the context of the multidisciplinary GEOFLAMME project, this thesis subject aims at understanding the impact of the volcano establishment on the sedimentary biogeochemical cycles linked to early diagenesis. Indeed, tectonic and magmatic mechanisms possibly lead to increased fluids circulation which may increase methane and/or CO₂ inputs. How will current carbon budgets be impacted? Can we quantify the modifications in biogeochemical processes due to metal-rich particles (Fe, Mn) deposition during eruptions? The thesis will focus on the results of the GEOFLAMME campaign in April-May 2021 during which samples of pore water and sediment at depths of up to 10 m in the sediments will be taken on a transect approaching the volcano and the areas affected by changes in circulation and deposition of volcanic particles. Analyses of the composition of

fluids and sediments (including carbon isotopes in methane and inorganic carbon) will enable highlighting the diagenetic processes in sediments, the influence of the volcanic input and allow to answer questions about the control of methane and CO₂ effluxes from these sediments.

Key words

Sediment, biogeochemistry, Mayotte volcanic eruption, fluids, isotopy

Expected profil

The candidate will have a background in oceanography or analytical chemistry - marine chemistry. As the project will be interdisciplinary, the candidate is expected to show curiosity and motivation to approach different domains such as the geological setting of the new volcano or hydrothermal systems. He / she should have good writing skills in English.

Specific working conditions

- The candidate will share time between Ifremer in Brest and LSCE in Gif sur Yvette
- The candidate will have the opportunity to spend some time in a laboratory abroad
- Participating to a scientific cruise is a possibility

This PhD fellowship is a real opportunity to work on Ifremer's scientific and technological priority themes and share the methodology and knowledge on climate change and ocean fluxes at LSCE. The gross monthly salary will be 1900 euros for a period of 3 years, which cannot be combined with other scholarships.

How to apply for this position ?

The application file must include :

- a curriculum vitae
- a cover letter
- a reference letter
- an academic transcript (Bachelor + Master 1 and first semester Master 2)

Your application must be **compiled into 2 PDF files, up to 1.5 MB for each file and you have to apply online at:**

<https://ifremer.jobs.net/fr-FR/job/these-influence-de-la-circulation-des-fluides-sur-la-diagenese-sedimentaire-suit/J3N4WL6GZXL8736T57R>

In case of any problem in attaching your documents, please upload your CV on this page (this step is mandatory for your application to be considered) and send all the documents to the thesis supervisors :

lucie.pastor@ifremer.fr and rabouill@lsce.ipsl.fr

The deadline for applications is 17/05/2021. Nevertheless, we strongly urge you to let us know as soon as possible of your intention to apply, by contacting the subject supervisor.

Doctoral students' contracts will start as of October 1st, 2021, subject to the submission of administrative documents authorizing Ifremer to recruit the doctoral student (certificate of completion of the Master 2 or engineering degree + visa for foreign doctoral students outside the EU).

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