



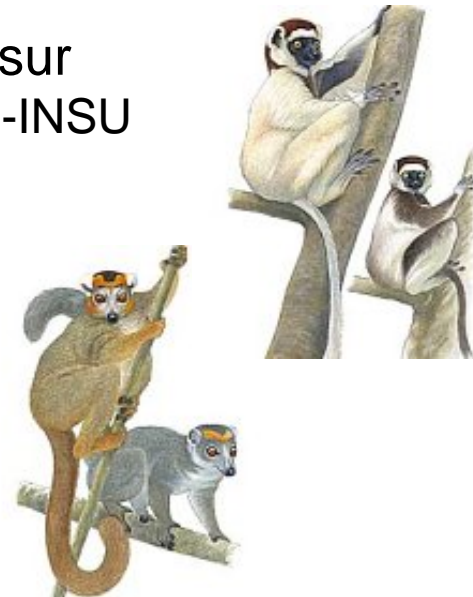
Origin of lemurs in Madagascar: what to expect from marine and GPS investigations?

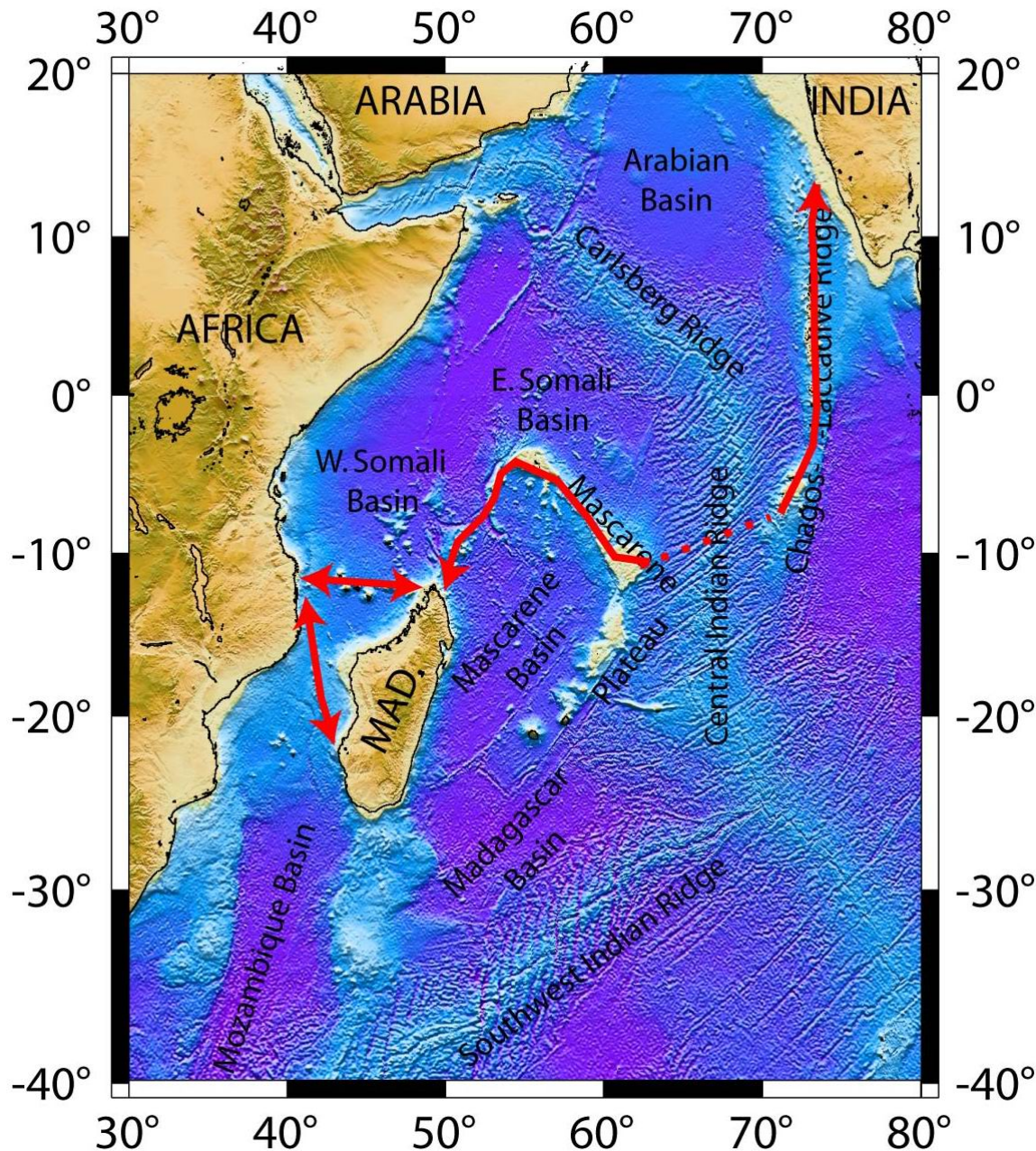


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Introduction

Where do the lemurs come from? How did they reach Madagascar?

- **Natural rafts** from Africa
→ highly improbable

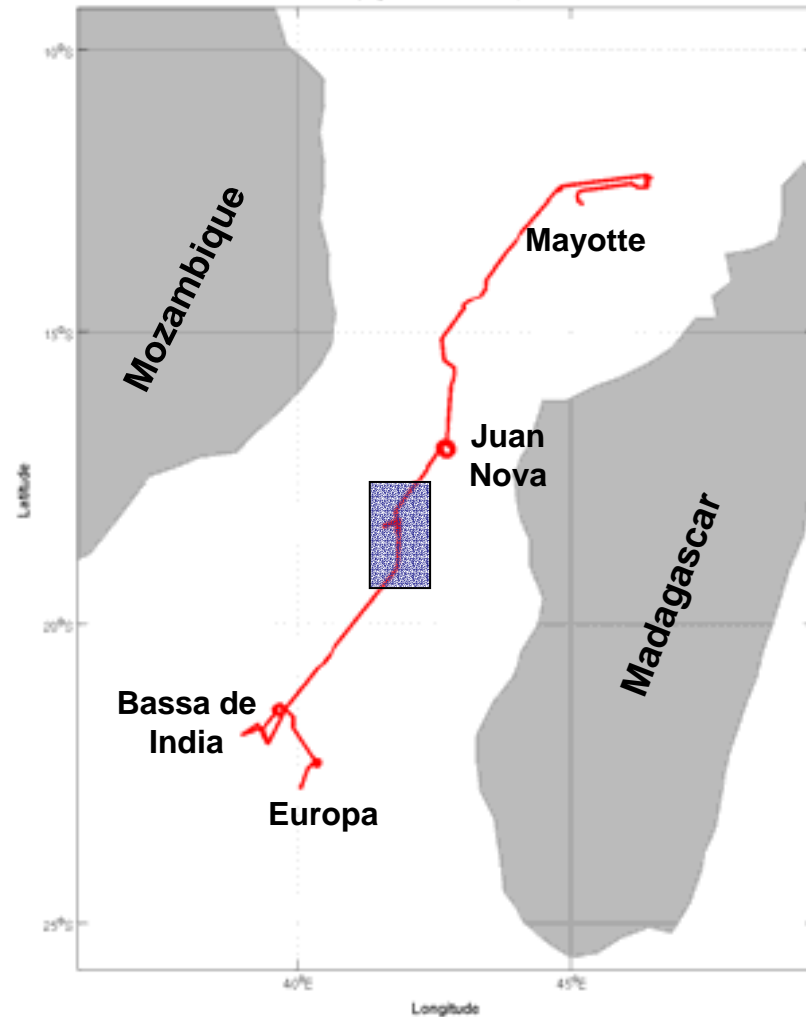
- **Land bridges**

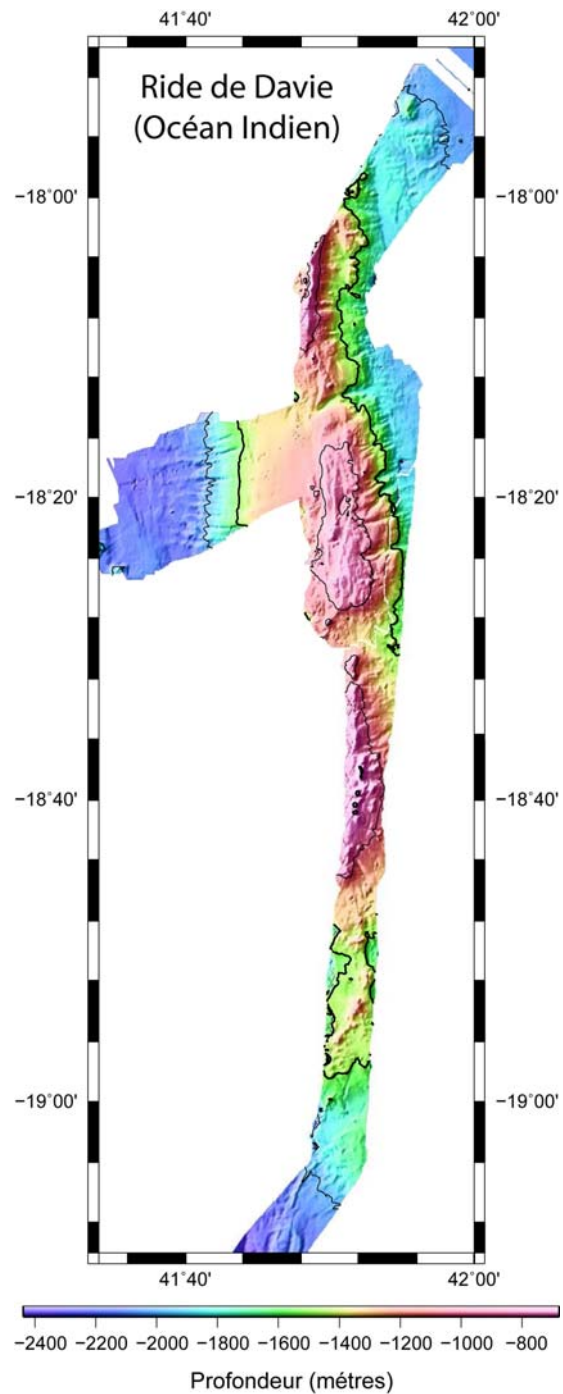
- from Africa
 - Davie Ridge
 - Comoros Islands
- from India
 - Chagos Laccadives Ridge, Mascarene & Seychelles plateaus

→ hereafter we describe our investigations of a possible African path on the Davie Ridge

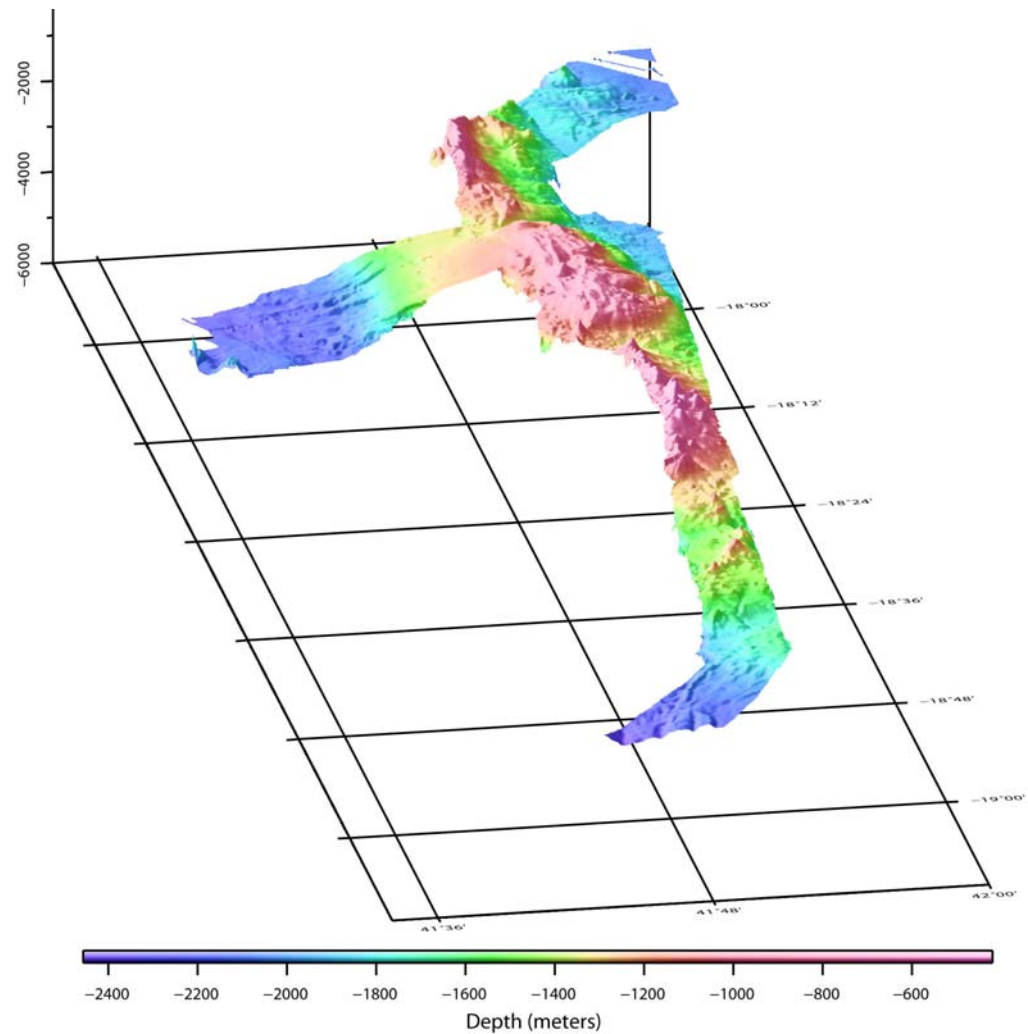
Marine investigations on the Davie Ridge

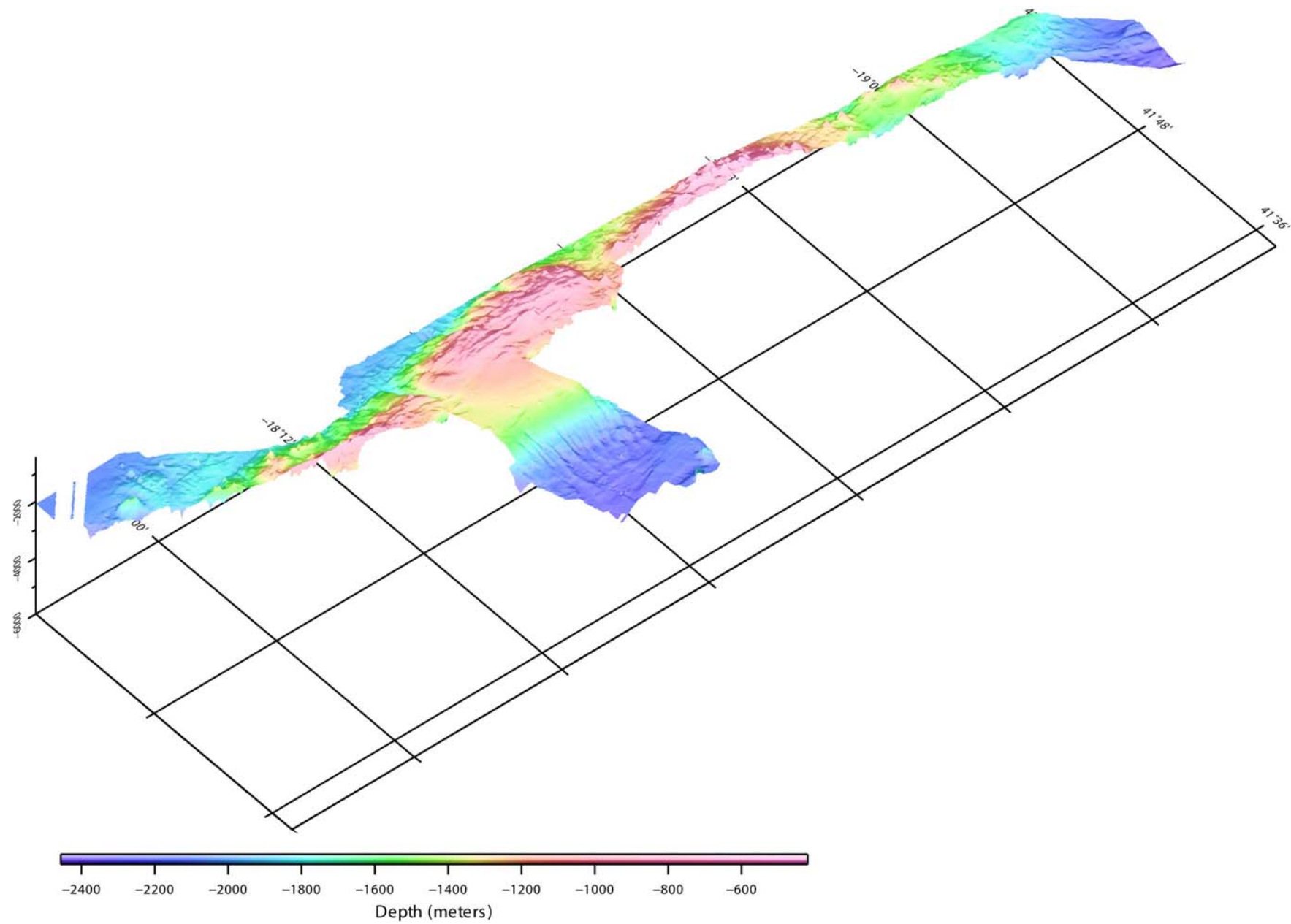
In 2003, the new hydrographic vessel *Beautemps-Beaupré* achieved a test cruise around Africa. She completed a bathymetric survey of “Iles Eparses”, a French district in the Mozambique channel, and collected bathymetric data on the Davie Ridge.

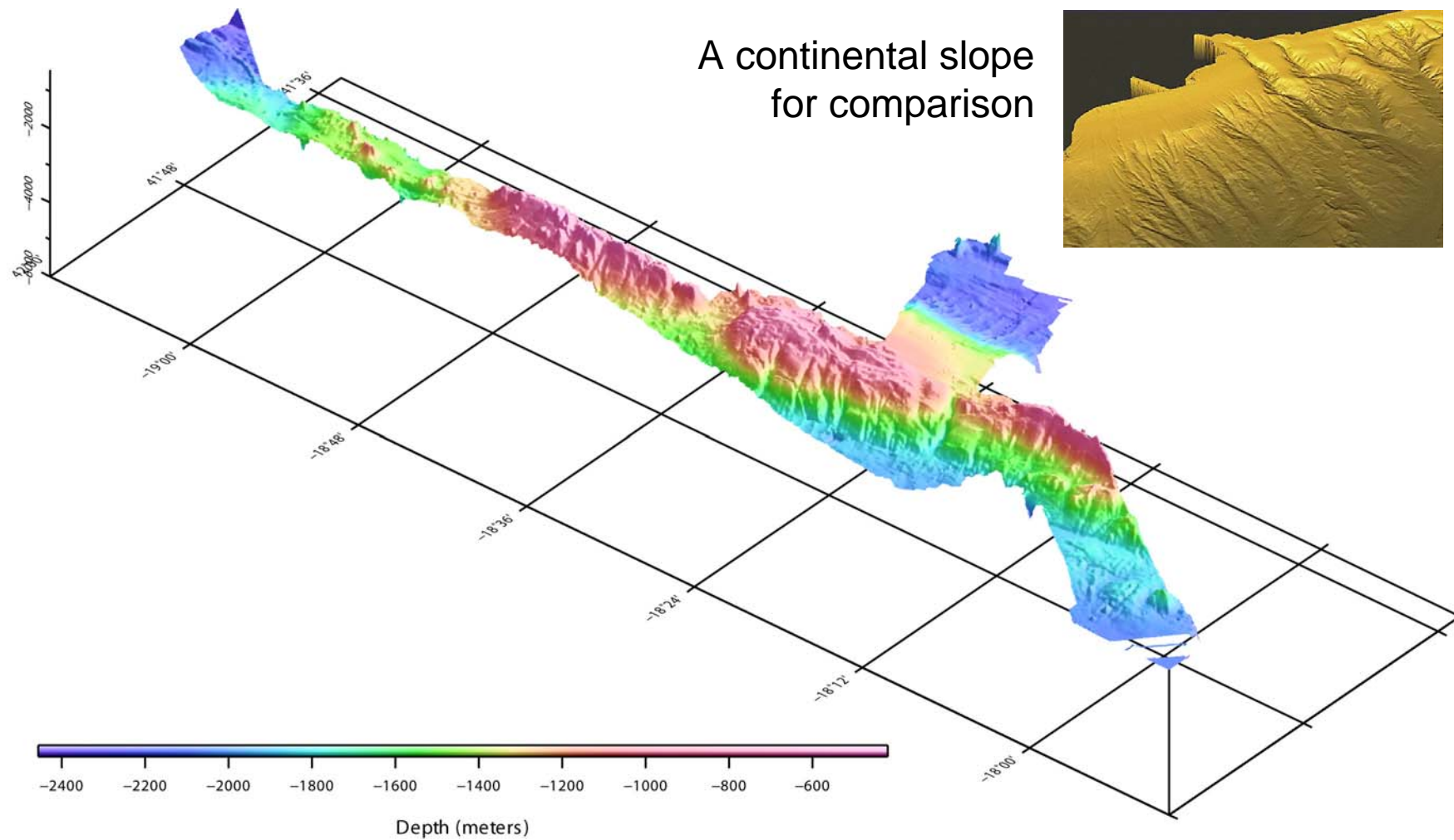




We could obtain and process these data.
Here are a maps and some 3D views.





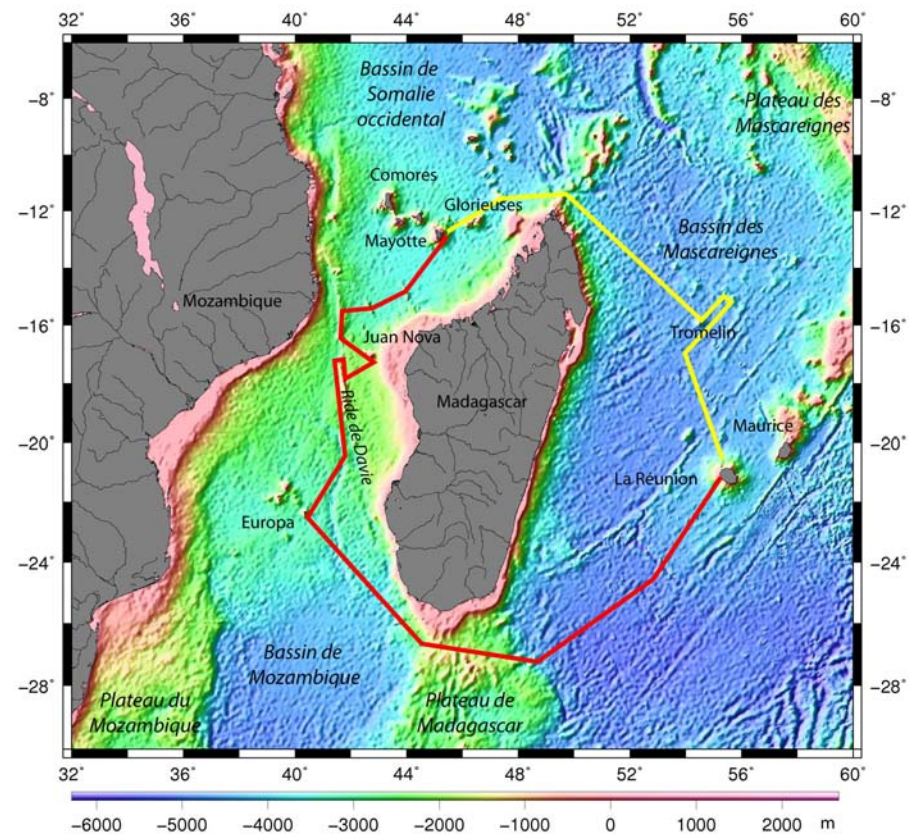


Observed small gullies can be interpreted as the trace of erosional flow on the slopes of a subaerial structure, suggesting that at least parts of the Davie Ridge were emerged during its history.

To go further: proposal **MaGIE** (Marine Geophysics on Iles Eparses)
to valorize transits of R/V Marion Dufresne journey on *Iles Eparses*

In 2008, TAAF issued a call for proposal to valorize operations of a one month journey in *Iles Eparses* onboard R/V Marion Dufresne, in April-May 2009.

Unfortunately, oceanography could not be considered and our proposal was rejected.



Routes proposed in project MaGIE

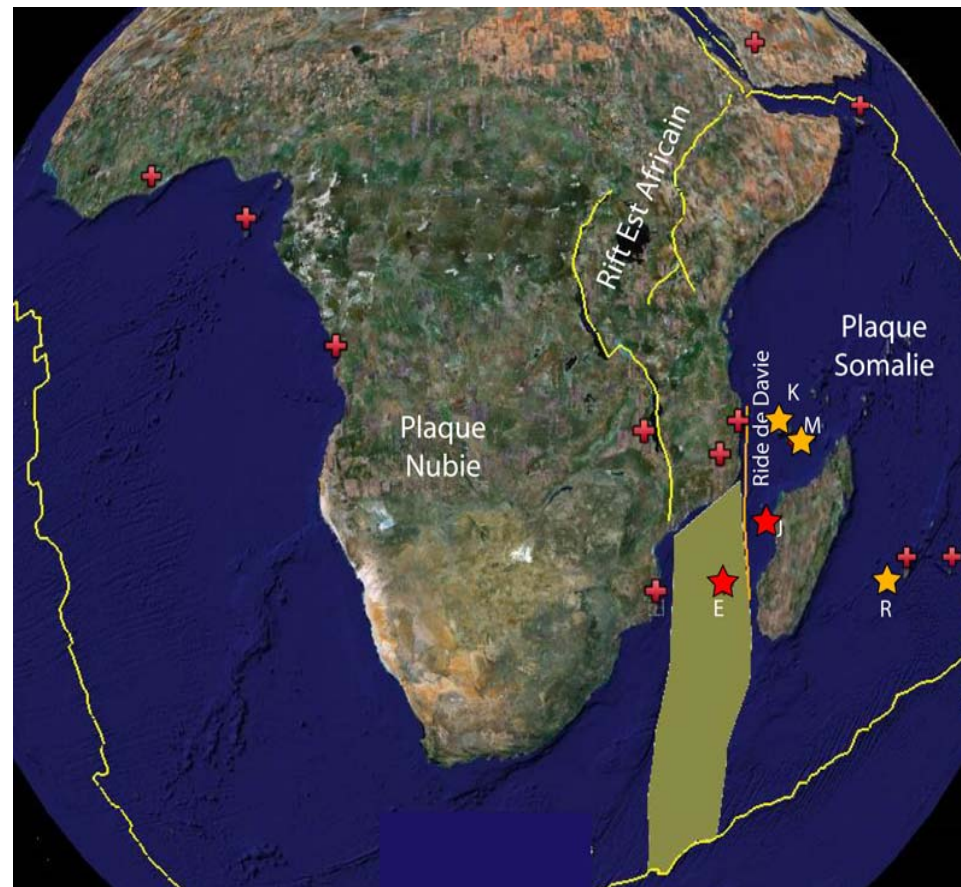
GPS investigations across the Davie Ridge

Proposal **GPSIE** (GPS on Iles Eparsees)

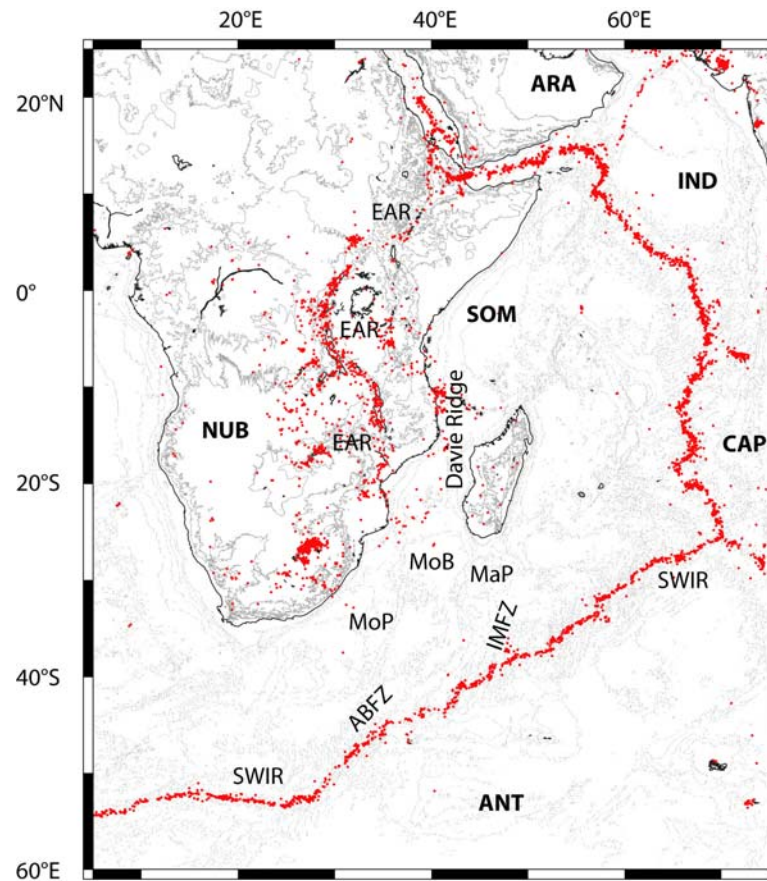
As part of the same call for proposal, we submitted project GPSIE to install GPS stations on Europa and Juan Nova islands, located on both sides of the Davie Ridge.

This proposal was accepted.

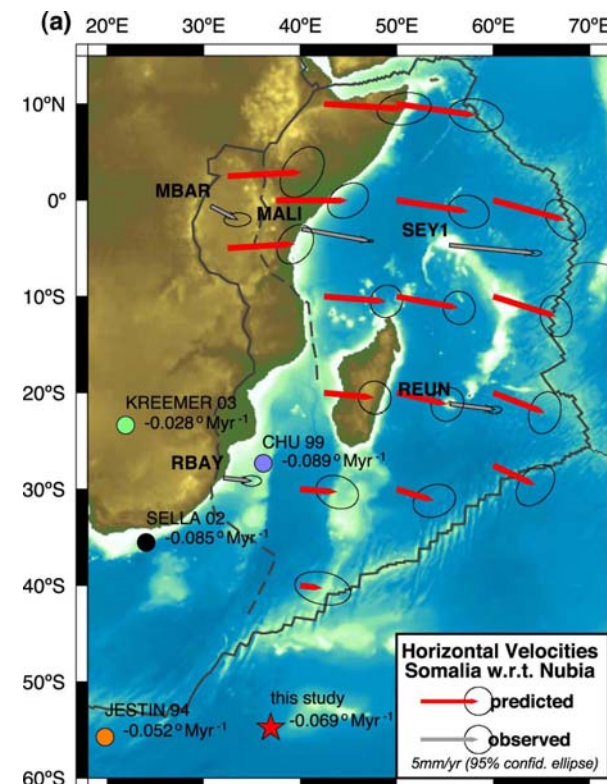
The two stations complement a network operated by our Portuguese colleague in Africa (including Mozambique and Mauritius).



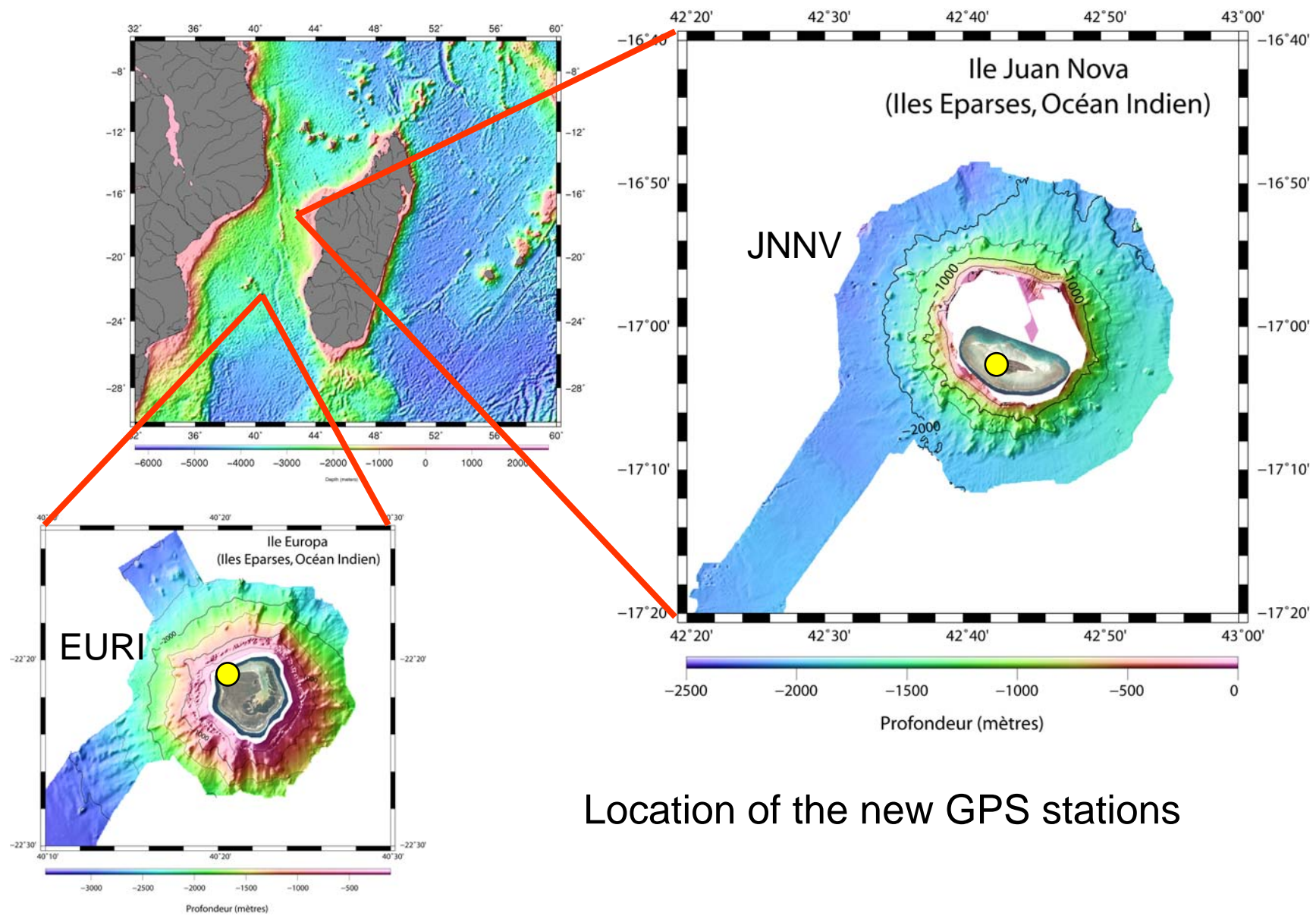
The Davie Ridge is part of the southern continuation of the East African Rift and therefore of the Nubia-Somalia plate boundary. A significant subsidence may be expected if most of the deformation is focused on the ridge, an hypothesis that the GPS network will help to evaluate.



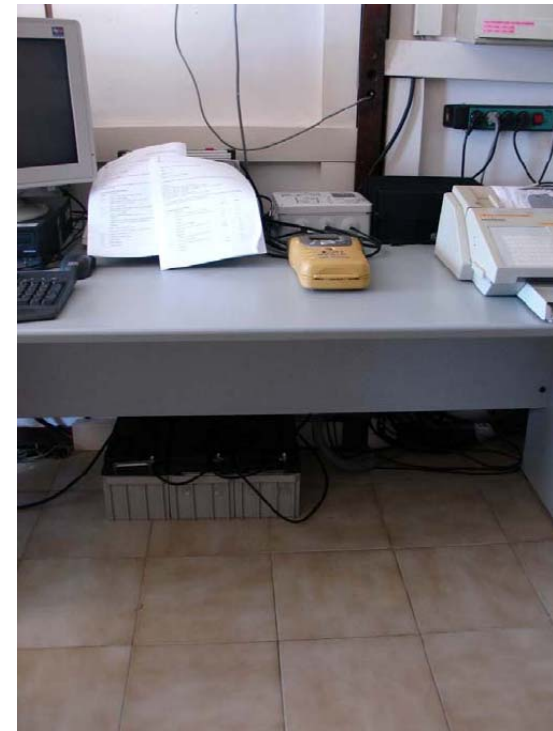
Seismicity of the Western Indian Ocean



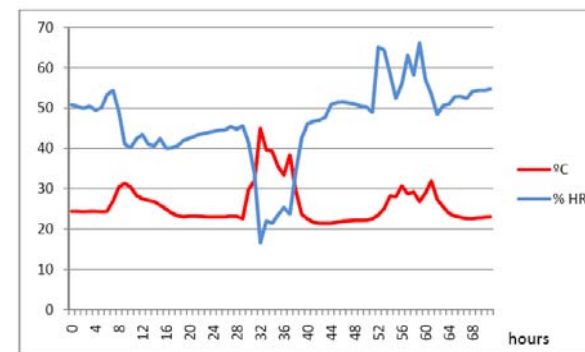
Modeled motion of Somalia relative to Nubia from a few GPS stations



Location of the new GPS stations

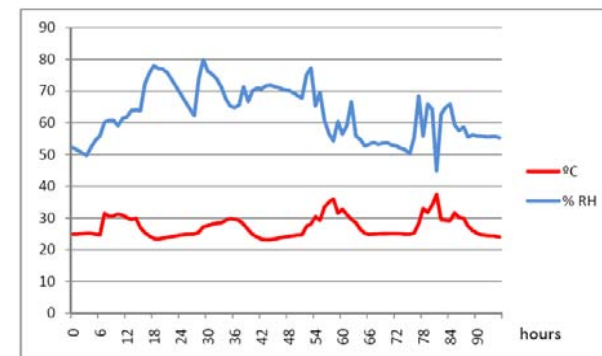


EUROPA GPS STATION





JUAN NOVA GPS STATION



Conclusions

Continuation of this work on the “African path” will include

- other attempt(s) to use a ship of opportunity to extend our bathymetric survey of the Davie Ridge
- collect several years of GPS data on *Iles Eparses*, to evaluate the deformation across the Davie Ridge

Investigation on the “Indian path” will start by reassessing the existing DSDP-ODP-IODP holes and, if possible, industrial wells on the Chagos-Laccadive Ridge, Mascarene Plateau, and Seychelles Bank.

This work is seen as preliminary – we expected to start working with our South African colleagues by inviting them to join Marion Dufresne for the MaGIE bathymetric survey. Unfortunately this part was turned down and we were offered only two berth to achieve the installation of the GPSIE GPS stations this Spring...