

## **Barcelona meeting for preparation of EUROFLEETS 2 PROPOSAL, 18<sup>TH</sup> -19<sup>TH</sup> March, 2014 on the Gloria-SWIM Transform Faults connection**

**Venue:** CMIMA, Barcelona.

**Date:** 18<sup>th</sup>-19<sup>th</sup>, February 2014

**Participants:** E. Gràcia, M. A. Gutscher, Ch. Hensen, F. Rosas, L. M. Pinheiro, P. Terrinha & N. Zitellini

### **Agenda:**

#### **17<sup>th</sup> March: arrival in BCN**

#### **18<sup>th</sup> March**

9:00-13:00- discussion on the draft proposal for the EUROFLEETS 2 call

13:00-14:30- lunch

14:30-17:00- establish the survey plan

17:00-17:30- break

17:30-19:30- finish survey plan

#### **19<sup>th</sup> March**

9:00-13:00- write texts and prepare figures

14:00- 17:00- finish draft of the meeting proposal and establish tasks for participants (homework)

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### **Abstract**

The SWIM-Gloria transform fault connection remains a puzzle to be understood. The Gloria Transform Fault exceeds 1000 km in length and has recorded instrumental earthquakes of  $M > 7.1$  to 8.4. The SWIM Fault has also been described as a transform fault plate boundary (Zitellini et al., 2009) and coincides with the southern boundary of the SW Iberia seismicity zone where the 1755 Lisbon earthquake with estimated magnitude  $M \sim 8.3-8.5$ , and the 1969  $M = 7.9$  earthquake was produced.

The SWIM Transform Fault System has been recognized as a controlling the location of mud volcanoes across different tectonic settings, such as the within and out of the Gulf of Cadiz Accretionary wedge. More recently, during the TRANSFLUX M86/5 cruise along the deepest part of the SWIM Fault, strong evidence was gathered pointing at deep fluid circulation from the oceanic basement through 5 km of

sediments in oceanic crust of ~140 Ma. The cold seeps associated with the mud volcanoes of the SWIM Fault System are known to host chemosynthetic communities associated with hydrocarbon seepage.

Research on the propagation of fluid flow along Transform Faults in old oceanic crust, its importance on the rheologic alteration of the crust and its bearing on the seismicity behaviour of high magnitude seismogenic faults, as well as the control of deep oceanic benthic fauna propagation across the ocean is one of the targets of this research group.

The COST-FLOWS kick off meeting in Bologna decided that applying for EUROFLEETS 2 ship time should be a strategic action of the group in order to pursue unfinished recent research in the scope of FLOWS.

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Minutes:

A group of 7 FLOWS members held a meeting in Barcelona from Tues 18 - Wed 19 March 2014. The meeting was hosted by Eulalia Gracia in CMIMA-CSIC. The main purpose of the meeting was to prepare a shiptime application to be submitted for the EuroFleets call for 2015. Three vessels seemed to offer attractive possibilities for work to be performed in the general Gloria Fault - Gorringe bank vicinity: Spanish R/V Sarmiento di Gamboa (6 days), French R/V PourquoiPas (10 days), Italian R/V Explora (8 days). On Tuesday we presented the state of the art on the tectonics, kinematics and seismicity of the E-W trending Eurasia-Africa plate boundary west of Gibraltar (Gulf of Cadiz to the Gloria transform fault). Then the open questions were discussed, such as the connectivity of various fault systems (SWIM lineaments, Gorringe and Gloria faults) and the effect of the Torre-Madeira rise (a NNE-SSW trending zone of anomalous thickened crust with Cretaceous to Quaternary volcanism) which lies directly astride the Eurasia-Africa plate boundary and where the linear Gloria Transform fault to the west seems to splay into a set of two or three different trending segments with various (compressive, transpressive, transtensional) expressions.

Several e-mail and telephone contacts were made during the day with the organizers of the EuroFleets call and to the responsible people for the vessels in order to confirm the availability and costs of the equipment on board.

Given the number of days of available ship time and the methods available, it was decided to construct a project on the connectivity of the faults in the Torre-Madeira region with 4 days of multi-channel seismics (3km long streamer) and 1 day of coring with the Sarmiento di Gamboa. We discussed different possible layouts for seismic profiles and agreed upon a set of profiles which can be reasonably be acquired in 4 days (< 480 nm) and which will cross the Gloria fault and the splays east of the Torre-Madeira rise at favourable orientations (with respect to the structural trends) and in areas where seismic imaging should be possible and reveal evidence of recent deformation if present (e.g. - moderately thick sedimentary cover).