



CALL FOR SCIENTISTS

IODP Expedition 381: Corinth Active Rift Development

An IODP Mission Specific Platform Expedition organised by the
ECORD Science Operator (ESO)

www.eso.ecord.org

Guide for Scientists from Greece

Applications are invited from scientists in Greece to join the Science Party for IODP Expedition 381: Corinth Active Rift Development. Any scientist who feel that his/her expertise is relevant to the objectives of the proposal may apply.

The proposal upon which this expedition is based was submitted as IODP Proposal #879 'Corinth Active Rift Development'. The full proposal describing the primary drill sites, as well as up-to-date expedition information, can be found on the Expedition 381 webpage <http://www.ecord.org/expedition381/>.

The Co-chief Scientist for this Expedition is Professor Lisa McNeill, University of Southampton. A second Co-chief Scientist will be confirmed in due course.

Background and Objectives

Continental rifting is fundamental for the formation of ocean basins and hydrocarbon-bearing rifted margins, and active rift zones are dynamic regions of high geohazard potential. But much of what we know from the fault to plate scale is poorly constrained and is not resolved at any level of spatial or temporal detail over a complete rift system.

This expedition will drill within the active Corinth Rift, Greece, where deformation rates are high, the syn-rift succession is preserved and accessible, and a dense, seismic database provides a high resolution fault network and seismic stratigraphy for the recent rift history but with limited chronology. In the Gulf of Corinth, the expedition can achieve an unprecedented precision of timing and spatial complexity of rift-fault system development and rift-controlled drainage system evolution in the first 1-2 Myr of rift history.

The expedition aims to resolve at a high temporal and spatial resolution how faults evolve, how strain is (re-)distributed, and how the landscape responds within the first few Myrs in a non-volcanic continental rift, as modulated by Quaternary changes in sea level and climate. High horizontal spatial resolution (~1-3 km) is provided by a dense grid of seismic profiles offshore that have been recently fully integrated, complemented by extensive outcrops and fault

analysis onshore. High temporal resolution (~20-50ka) will be provided by seismic stratigraphy tied to core and log data from three carefully located boreholes to sample the recent syn-rift sequence.

Two primary themes will be addressed by the drilling integrated with the seismic database and onshore data. First, fault and rift evolutionary history (including fault growth, strain localization and rift propagation) and deformation rates: the spatial scales and relative timing can already be determined within the seismic data offshore. Dating of drill core will provide the absolute timing offshore, the temporal correlation to the onshore and the ability to quantify strain rates from individual faults to the whole rift scale. Second, the response of drainage evolution and sediment supply to rift and fault evolution: core data will define lithologies, depositional systems and paleoenvironment, including catchment paleo-climate, basin paleobathymetry, and relative sea level. Integrated with seismic data, onshore stratigraphy and catchment data, we will investigate the relative roles and feedbacks between tectonics, climate and eustasy in sediment flux and basin evolution. A multidisciplinary approach to core sampling integrated with log and seismic data will generate a Quaternary chronology for the syn-rift stratigraphy down to orbital timescale resolutions and resolve the paleoenvironmental history of the basin in order to address the objectives.

The expedition aims to drill, core, and log up to 750m-deep boreholes at three sites in the central and eastern Gulf of Corinth. The procurement process to contract platform and drilling services is currently being undertaken by ESO, and it is envisaged that the setup will involve a geotechnical vessel equipped with a coring rig, and outfitted with ESO's laboratory containers.

Timing

Until the platform and drilling services are procured (estimated Spring 2017) all timings are provisional. It is envisaged that the offshore phase of the expedition will last a maximum of 60 days during October and November 2017, with only a subset of the Science Party participating. Offshore activities will focus on core recovery, curation, sampling for ephemeral properties, biostratigraphy, physical properties, preliminary lithostratigraphy (whole core observed at core ends and through plastic liners), and downhole logging. The cores will not be split at sea.

Subsequently, an Onshore Science Party (OSP) will be held at the MARUM - Center for Marine Environmental Sciences, University of Bremen, Germany, in February 2018 (exact dates to be confirmed), where the cores will be split. The OSP will be a maximum of 4 weeks long, the exact length dependent on core recovery. All members of the Science Party must attend the Onshore Science Party. Please see <http://www.eso.ecord.org/expeditions/msp.php> (and linked pages within) for an overview of Mission Specific Platforms in IODP.

Successful applicants will be invited either as an offshore-onshore participant, or as an onshore-only participant. Please note that there are no opportunities for offshore-only participation.

Expertise sought

Opportunities exist for researchers (including graduate students) in all specialties. While other expertise may be considered, specialists in the following fields are required: paleontology, sedimentology, organic geochemistry, inorganic geochemistry, structural geology, paleomagnetism, physical properties, geophysics and petrophysics/downhole logging. For the offshore phase of the expedition, we are particularly looking for the following fields: paleontology, sedimentology, organic geochemistry, inorganic geochemistry, physical properties, and petrophysics/downhole logging.

Information webinar

To learn more about the scientific objectives of this expedition, life at sea, and how to apply to sail, please join us for a web-based seminar on **Tuesday 14th February 2015** at 1pm GMT.

To participate in the webinar, you will need access to the internet with a computer equipped with a speaker and microphone (optional). To register, please visit:

<https://www.surveymonkey.co.uk/r/IODP381>

Where to apply

Greece, as a non-IODP partner in IODP Expedition 364, will utilise the application form of ECORD's Science Support & Advisory Committee (ESSAC).

To apply for this expedition, Greek scientists should download the expedition "Apply to Sail" form:

<http://www.ecord.org/?ddownload=7213>

PLEASE DO NOT RETURN THE FORM TO ESSAC!

The application form should be sent to Dr Dimitris Sakellariou, Hellenic Centre for Marine Research (sakell@hcmr.gr) no later than **Tuesday 28th February 2017**; shortlisted candidates will be considered by ESO in Spring 2017.

For further details from ESO, please contact:

David McInroy, ESO Science Manager, dbm@bgs.ac.uk