

## International Ocean Discovery Program



CALL FOR APPLICATIONS



Apply to participate in *JOIDES Resolution* Expeditions

Application deadline: 15 April 2018

### Guaymas Basin Tectonics and Biosphere Expedition (385)

September to November 2019

IODP Expedition 385 (based on Proposals 833-Full2 and 833-Add) will core and log a series of sites in the Guaymas Basin to investigate the relationship of tectonics, magmatism, sedimentation, carbon cycling, and microbial activity. The Guaymas Basin in the Gulf of California is a young, marginal rift basin characterized by active seafloor spreading and rapid deposition of organic-rich sediments from highly productive overlying waters. The active formation of oceanic crust combined with a thick sedimentary overburden has given rise to a dynamic environment, where strongly connected physical, chemical, and biological processes govern the cycling of sedimentary carbon. Its fate upon deposition depends on the relative efficiencies of interrelating microbial and chemical processes, leading either to sequestration or release of carbon. Expedition 385 aims to illuminate the interaction between these processes and its ultimate consequences for carbon cycling, which will help understand similar settings in marginal seas throughout the world.

Drilling toward and through seismically imaged sills of varying age and temperature into the intercalated sill-sediment package will provide core and log data to constrain the links between sediment accumulation, sill emplacement, sediment alteration, fluid expulsion, as well as microbial utilization and sequestration of carbon along subseafloor fluid pathways. The primary objectives are to

- (1) Explore the physical and chemical gradients along active and extinct fluid pathways associated with sill emplacement;
- (2) Investigate subsurface microbial communities that are sustained by alteration products, in order to determine how efficiently they capture carbon-bearing alteration products; and
- (3) Advance our understanding of the conditions that limit life in the deep biosphere.

Coring sill-sediment successions will provide an integrated record of igneous accretion as well as baseline data of carbon flux, including unaltered subsurface sediments and those that have experienced multiple generations of sill intrusion at depth. Petrophysical data (e.g., porosity/permeability) will also constrain crustal fluid flow and heat exchange that exert fundamental controls on this system. All findings will deepen our understanding of mechanisms of carbon remobilization implicated in global-scale rapid climate change.

**For more information about the expedition science objectives and the *JOIDES Resolution* Expedition Schedule see**

<http://iodp.tamu.edu/scienceops/> - this includes links to the individual expedition web pages with the original IODP proposal and expedition planning information.

**WHO SHOULD APPLY:** Opportunities exist for researchers (including graduate students) in all shipboard specialties – including but not limited to sedimentologists, micropaleontologists, paleomagnetists, inorganic/organic geochemists, microbiologists, petrologists, petrophysicists, and borehole geophysicists.

**WHERE TO APPLY:** Applications for participation must be submitted to the appropriate IODP Program Member Office – see <http://iodp.tamu.edu/participants/applytosail.html>