

## International Ocean Discovery Program



CALL FOR APPLICATIONS



Apply to participate in *JOIDES Resolution Expeditions*

Application deadline: 1 March 2018

### **Plio-Pleistocene Dynamics of the Pacific Antarctic Circumpolar Current**

Expedition 383 ~20 May to ~20 July 2019

IODP Expedition 383 will investigate the Pliocene-Pleistocene atmosphere-ocean-cryosphere dynamics of the Pacific Antarctic Circumpolar Current (ACC), and their role in regional and global climate and atmospheric CO<sub>2</sub> based on sediment records with the highest possible stratigraphic resolution.

The expedition will test two major scientific hypotheses: (1) ACC dynamics and Drake Passage throughflow conditioned the global Meridional Overturning Circulation and high-low climate linkages on orbital and submillennial time-scales since the Pliocene. (2) Variations in the Pacific ACC determine the physical and biological characteristics of the oceanic carbon pump and atmospheric CO<sub>2</sub>.

The ACC is the world's largest current system connecting all three major basins of the global ocean (the Pacific, Atlantic and Indian Oceans) integrating and responding to climate signals throughout the globe. By inducing strong upwelling and formation of new water masses, the ACC also fundamentally affects the global meridional overturning circulation (MOC) and the stability of Antarctica's ice sheets, and has been recognized as a key mechanism in regulating variations in atmospheric CO<sub>2</sub> and global climate.

IODP Expedition 383 is based on IODP Proposals 912-Full & 912-Add and will target six primary sites on a transect in the central South Pacific between the modern Polar Front and the Subantarctic Zone, and at the Chilean Margin close to the Drake Passage. Central Pacific sites will document the Plio-Quaternary ACC paleoenvironmental history at water depths ranging from 5100 to 3600 m. At the Chilean Margin the sites provide a depth transect (~1000 - 3900 m) across the major Southern Ocean water masses that will document Plio-Pleistocene changes in the vertical structure of the ACC – a key issue for understanding the role of the Southern Ocean in the global carbon cycle.

The planned drilling strategy is designed for recovering sediment sequences suitable for ultra-high-resolution studies. The proposed sites are located at latitudes and water depths where sediments will allow the application of a wide range of siliciclastic, carbonate, and opal-based proxies for reconstructing surface to deep ocean variations and their relation to atmosphere and cryosphere changes with unprecedented stratigraphic detail.

#### **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, petrologists, petrophysicists, microbiologists, 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>