

International Ocean Discovery Program



CALL FOR APPLICATIONS



Apply to participate in *JOIDES Resolution Expedition*

Application deadline: 15 September 2017

South Pacific Paleogene Climate Expedition (378)

Heat Transport and Water Column Structure

During an Extreme Warm Climate

14 October – 14 December 2018

Expedition 378 will investigate the temperate to subpolar climate and oceanography of the very warm Eocene, as well as the middle and late Cenozoic, in the far southern Pacific Ocean. It will study how the Eocene earth maintained high global temperatures and high heat transport to the polar regions despite receiving near modern levels of solar energy input, as well as constrain the subpolar Pacific climate, oceanographic structure, and biogeochemical cycling of the very warm Eocene through the transition to Icehouse conditions in the Oligocene. Recovered sediments will be used to characterize water masses, deep and shallow ocean temperature, latitudinal temperature gradients, the strength of upwelling, and the strength of the zonal winds to study both the atmospheric and oceanic climatic subsystems.

The planned transect of drill sites will obtain sedimentary records of the Paleocene-Eocene boundary event, the sharp transition at the Eocene-Oligocene boundary, and a continuous sedimentary record at DSDP Site 277 (only spot-cored), one of the classic Paleogene high latitude South Pacific. This will provide a continuous record of the shallow subantarctic South Pacific from the Paleocene to late Oligocene.

The proposed work is set in the South Pacific Ocean since (a) Paleogene carbonates at present latitudes of 50°S exist at pelagic depths will permit a full range of paleoceanographic proxy-based investigations, and (b) appropriate high-latitude records are unobtainable in the Northern Hemisphere of the Pacific.

This expedition will also constrain (a) the Southern Ocean CCD history, (b) the presence of IRD that provides a record of Antarctic ice cover at least for the Paleogene, (c) and the development of the Antarctic Circumpolar Current (as the backtracked position of the sites is directly west of the proto-Drake Passage), (d) the poleward extent of the low-productivity sub tropical gyre, (e) establish the position of the polar front, (f) determine sea-surface temperatures and latitudinal temperature gradient, (g) determine the width and intensity of the high-productivity zone associated with these oceanographic features, (h) characterize the water masses formed in the sub-polar region, (i) determine the nature of the zonal winds and how they relate to oceanic surface circulation, (j) determine the mass balance of carbonates within the southern ocean, and (k) document the changes in these systems as climate evolves from the warm early Eocene to the cold Antarctic-influence system of the Oligocene.

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 that provide 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.

WHERE TO APPLY: Applications for participation must be submitted to the appropriate IODP Program Member Office – see

<http://iodp.tamu.edu/participants/applytosail.html>