



Heat flow in the Lesser Antilles island arc and adjacent back arc Grenada basin

Michael Manga (1), Matt Hornbach (2), Anne Le Friant (3), and Osamu Ishizuka (4)

(1) University of California, Berkeley, United States (manga@seismo.berkeley.edu), (2) Department of Earth Sciences, Southern Methodist University, Dallas, TX , (3) Institut de Physique du Globe de Paris, Sorbonne Paris Cite, Universite Paris Diderot, UMR 7175, CNRS 1, rue Jussieu, 75238 Paris, (4) Geological Survey of Japan/AIST, Central 7 1-1-1 Higashi, Tsukuba, Ibaraki, 305-8567, Japan

Using temperature gradients measured in 10 holes at 6 sites, we generate the first high fidelity heat flow measurements from Integrated Ocean Drilling Program drill holes across the northern and central Lesser Antilles arc and back arc Grenada basin. The implied heat flow, after correcting for bathymetry and sedimentation effects, ranges from about 0.1 W/m^2 on the crest of the arc, midway between the volcanic islands of Montserrat and Guadeloupe, to $< 0.07 \text{ W/m}^2$ at distances $> 15 \text{ km}$ from the crest in the back arc direction. Combined with previous measurements, we find that the magnitude and spatial pattern of heat flow are similar to those at continental arcs. The heat flow in the Grenada basin to the west of the active arc is 0.06 W/m^2 , a factor of 2 lower than that found in the previous and most recent study. There is no thermal evidence for significant shallow fluid advection at any of these sites. Present day volcanism is confined to the region with the highest heat flow.