



Giant pockmarks in the inner sea of the Maldives carbonate platform (Indian Ocean)

C. Huebscher (1), C. Betzler (2), T. Luedmann (3), J. Reijmer (4), S. Lindhorst (2), M. Roemer (2) and NEOMA scientific party

(1) Institute of Geophysics, University of Hamburg (contact: Christian.huebscher@zmaw.de), (2) Institute of Geology and Paleontology, University of Hamburg, (3) Institute of Biogeochemistry and Marine Chemistry, University of Hamburg, (4) Faculty of Earth Sciences, Vrije Universiteit Amsterdam

Giant pockmarks with diameters of up to 1500 m and depths of up to 180 m have been discovered in the Inner Sea of the Maldives carbonate platform by means of seismic and hydroacoustic data during the Meteor cruise M 74/4 (NEOMA) in December 2007. Many of the pockmarks correlate vertically with faults and pinnacles previously interpreted as patch reefs of late-Oligocene / early-Miocene age. A part of the pockmarks are grouped along the strike of deep routed faults in the volcanic basement. We identified several types of pockmarks. Some pockmarks reveal underlying bright spots. Most of the bright spots can be correlated with one particular sedimentary sequence. Other pockmarks are underlain by high amplitude reflection packages interpreted as diagenetic fronts or gas filled porous carbonates. Bright spots and high amplitude reflection packages are more abundant in the central axis of the middle sea and above the eastern flank of a N-S striking graben within the volcanic basement, where the oldest syn-rift sediments are present. The bases of the pockmarks correlate with particular sequences which suggest that the pockmark activity, i.e. fluid escape, occurred in distinct phases. The data give strong evidence that the seismic signatures of the (biogenic) carbonate deposits are partly overprinted by diagenetic processes and the migration of fluids or volatiles. To our knowledge this is the first record of giant pockmarks in an isolated carbonate platform.