

Figures

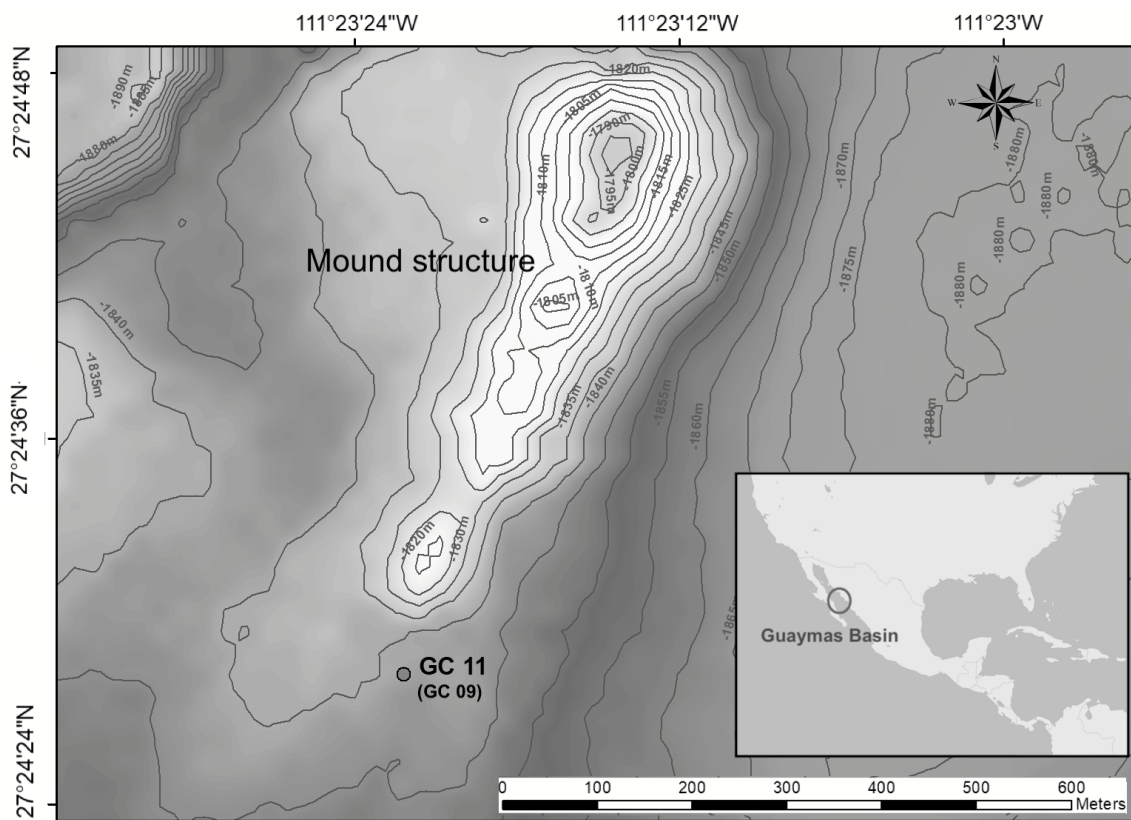


Fig 1: Bathymetric map of the sampling location at the Northern Trough of the Guaymas Basin, Gulf of California. The sediment core GC 11 was recovered about 100 m from the southern slope of the newly discovered mound structure with several active black smokers. The second core (GC 09) was located about 15 m away from GC 11 (indicated as an identical position on this map).

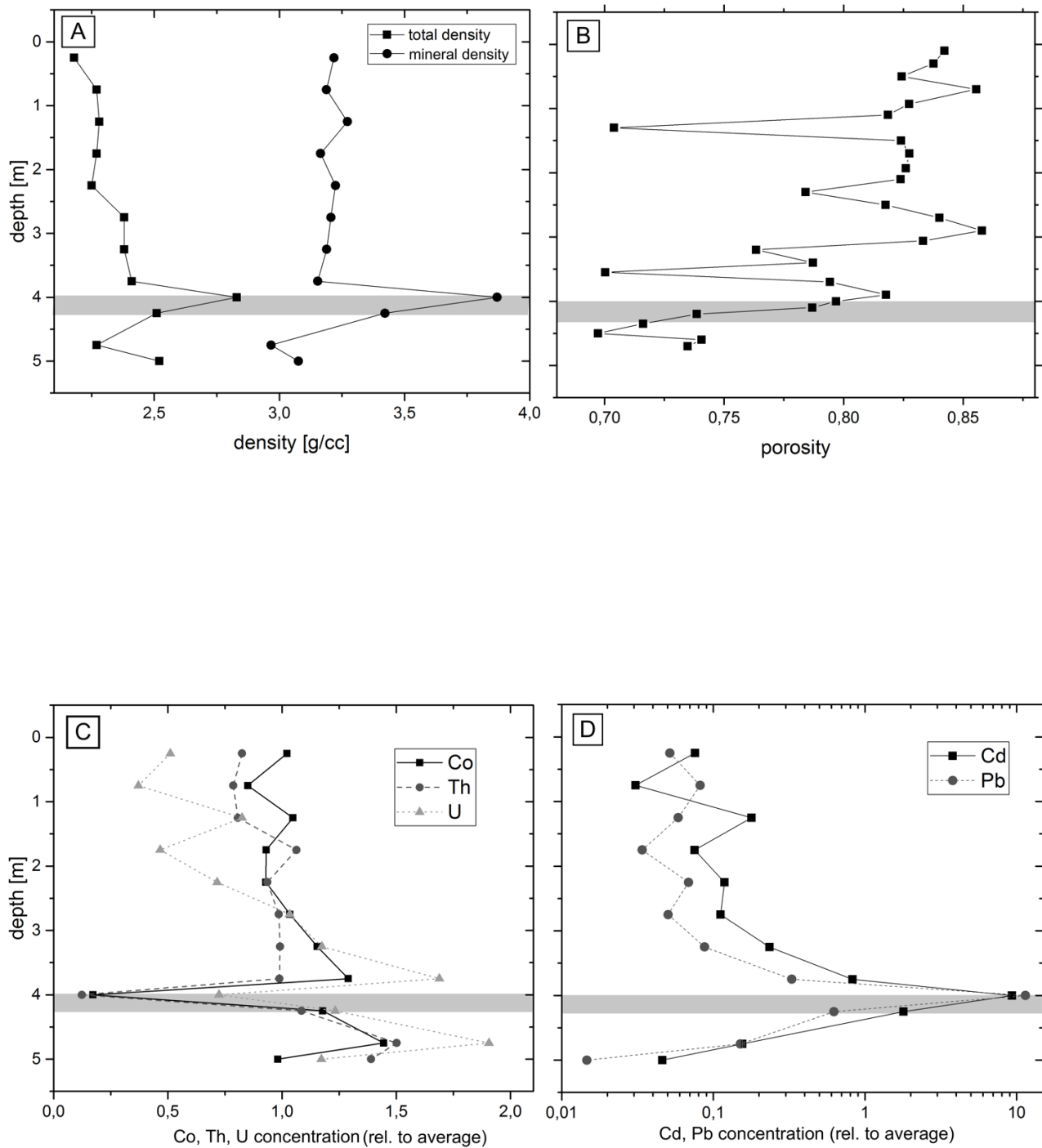


Fig 2: a) Density and porosity of dry sediments: total density (organic and inorganic material) obtained by a pycnometer, and scaled density of minerals from XRD measurements. b) Porosity taken from neighbouring core (GC09, about 15 m distance). The grey-shaded area indicates the high-density layer at 4 m depth. c) and d) Concentrations of various heavy metals with depth (uncertainties smaller than symbol size). Concentrations are plotted relative to the average value of the respective metal across depth. c) cobalt,

thorium and uranium, whose concentrations decrease in the dense layer. d) cadmium and lead concentrations, which are strongly enriched in the dense layer (note logarithmic scale).

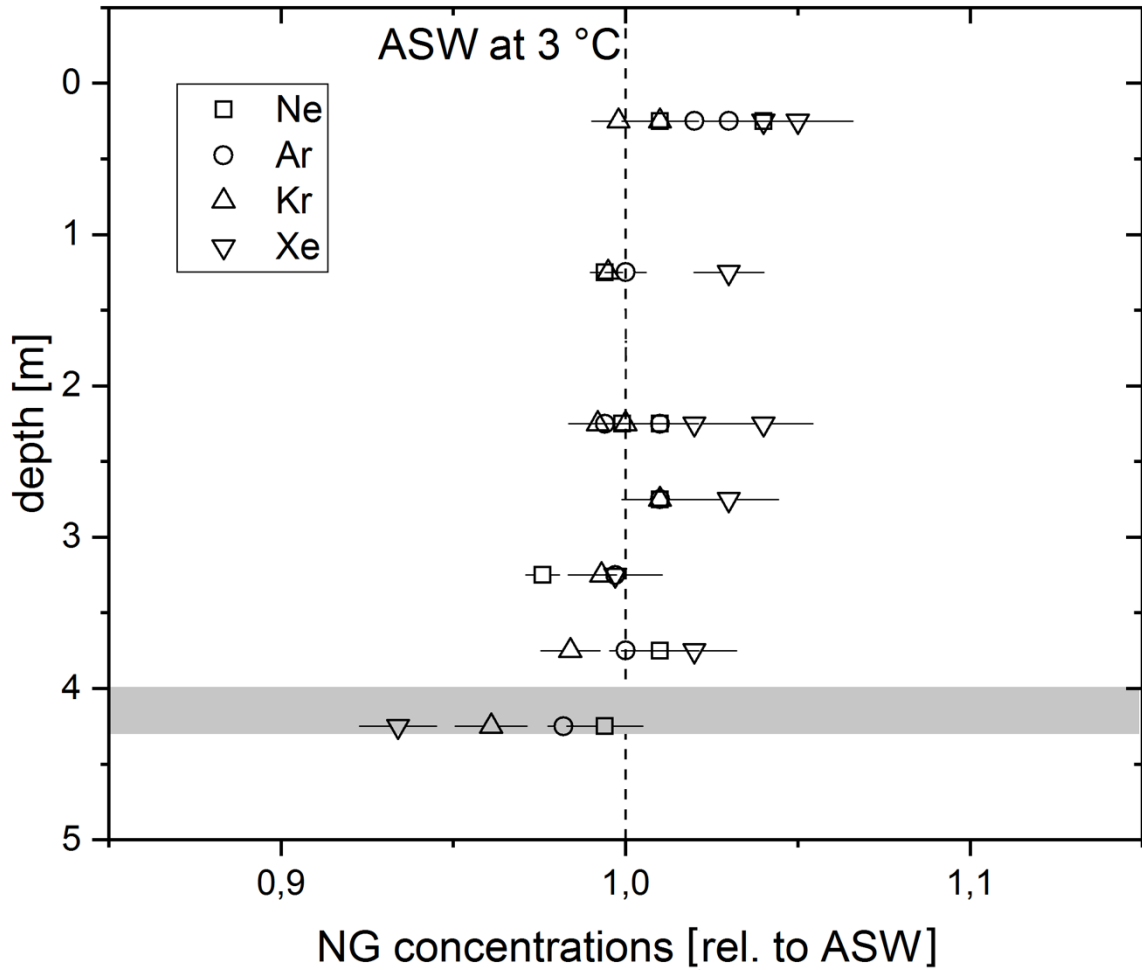


Figure 3: Concentrations of noble gases (except helium), relative to air-saturated water vs. depth in sediment core. The dashed line represents the atmospheric equilibrium concentration (ASW) of each gas at 3 °C and a salinity of 34 ‰. The grey area marks the high-density layer. Error bars represent uncertainties of 1 σ .

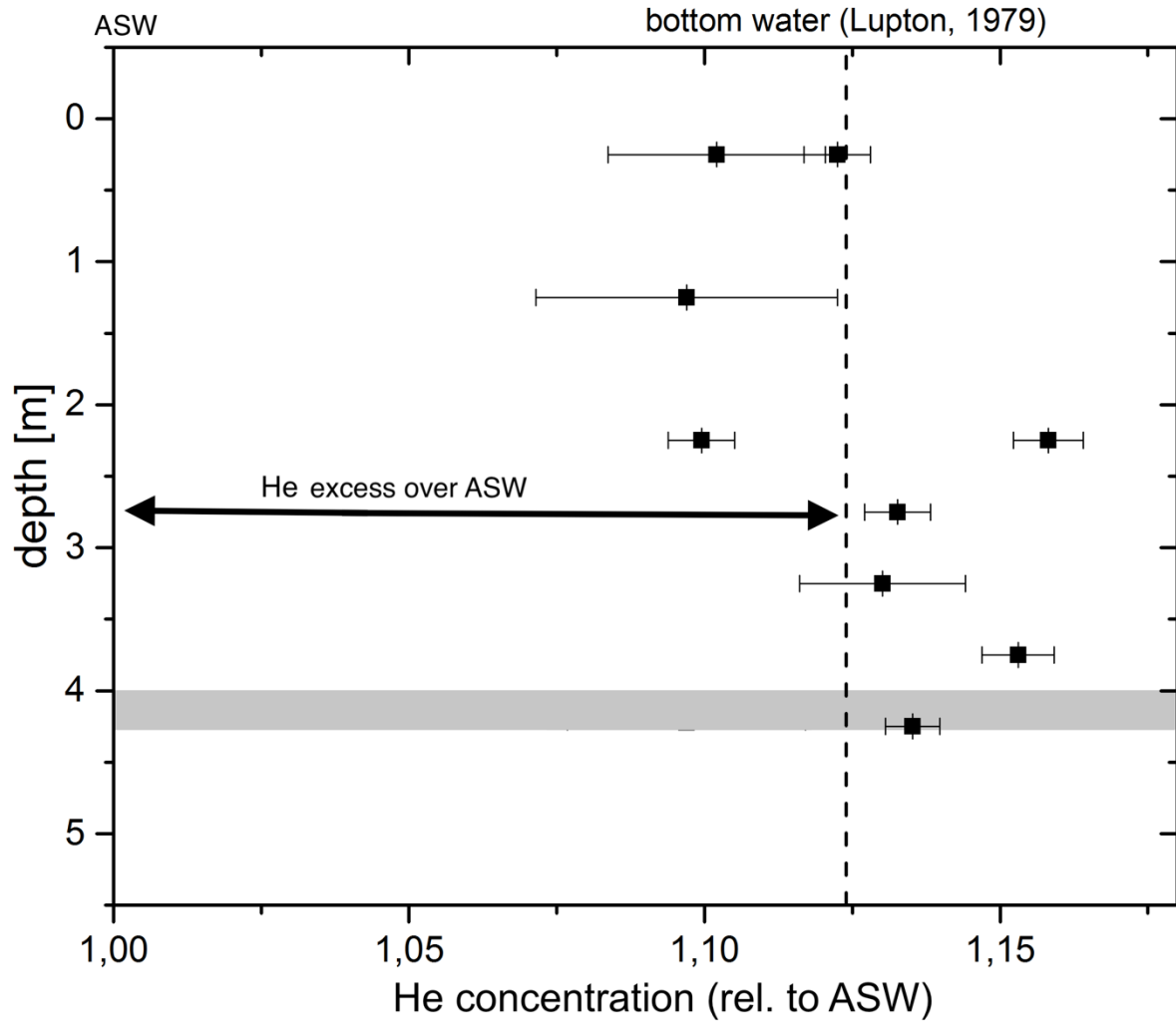


Fig 4: Total helium concentration relative to ASW with depth. The dashed line represents bottom water concentrations of the Guaymas Basin found by Lupton (1979). The grey area marks the high-density layer. Error bars represent uncertainties of 1 σ .

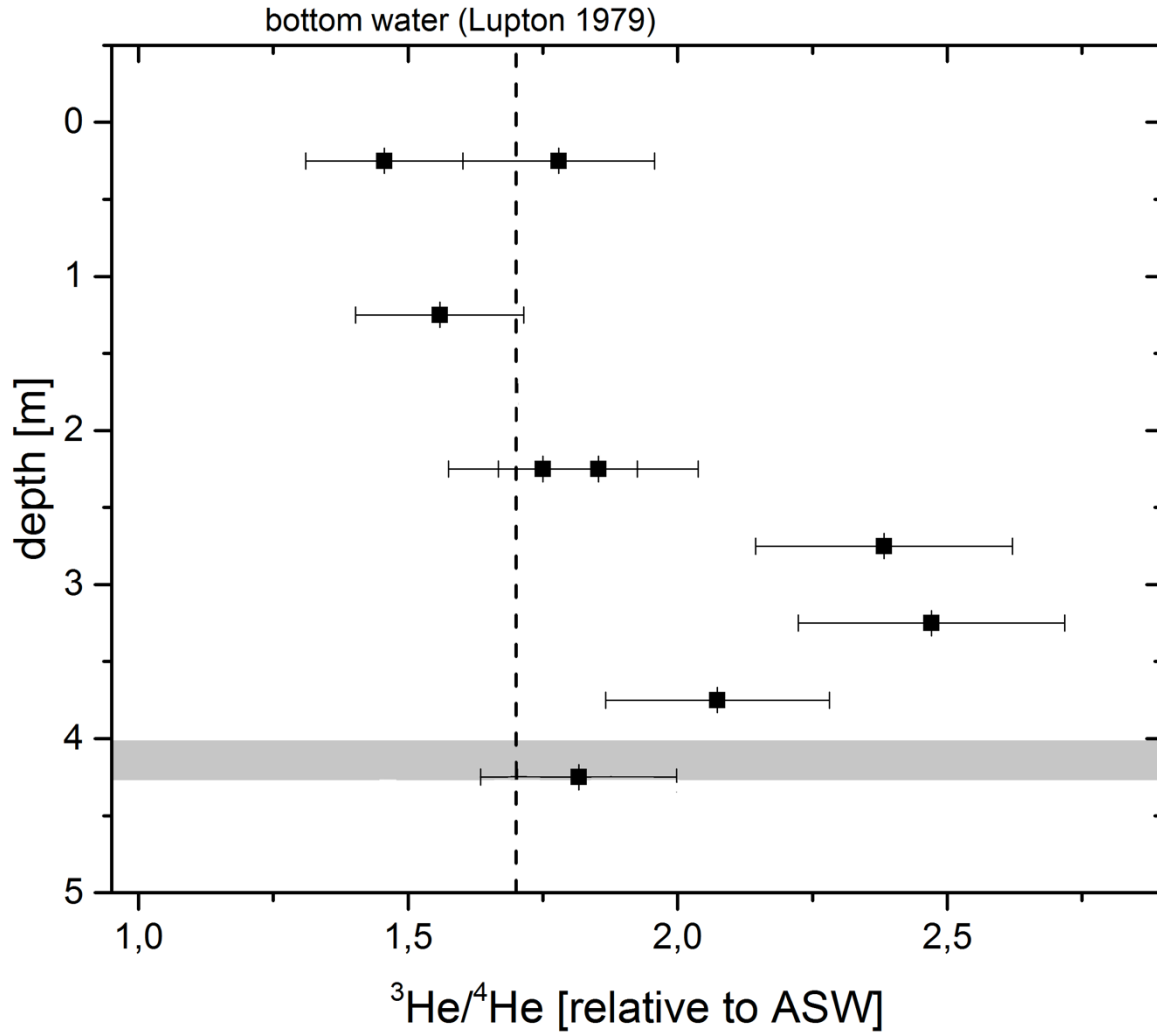


Fig 5: $^3\text{He}/^4\text{He}$ ratio relative to ASW with depth. The dashed line represents bottom water ratios in the Guaymas Basin found by Lupton (1979). The grey area marks the high-density layer. Error bars represent uncertainties of 1σ .

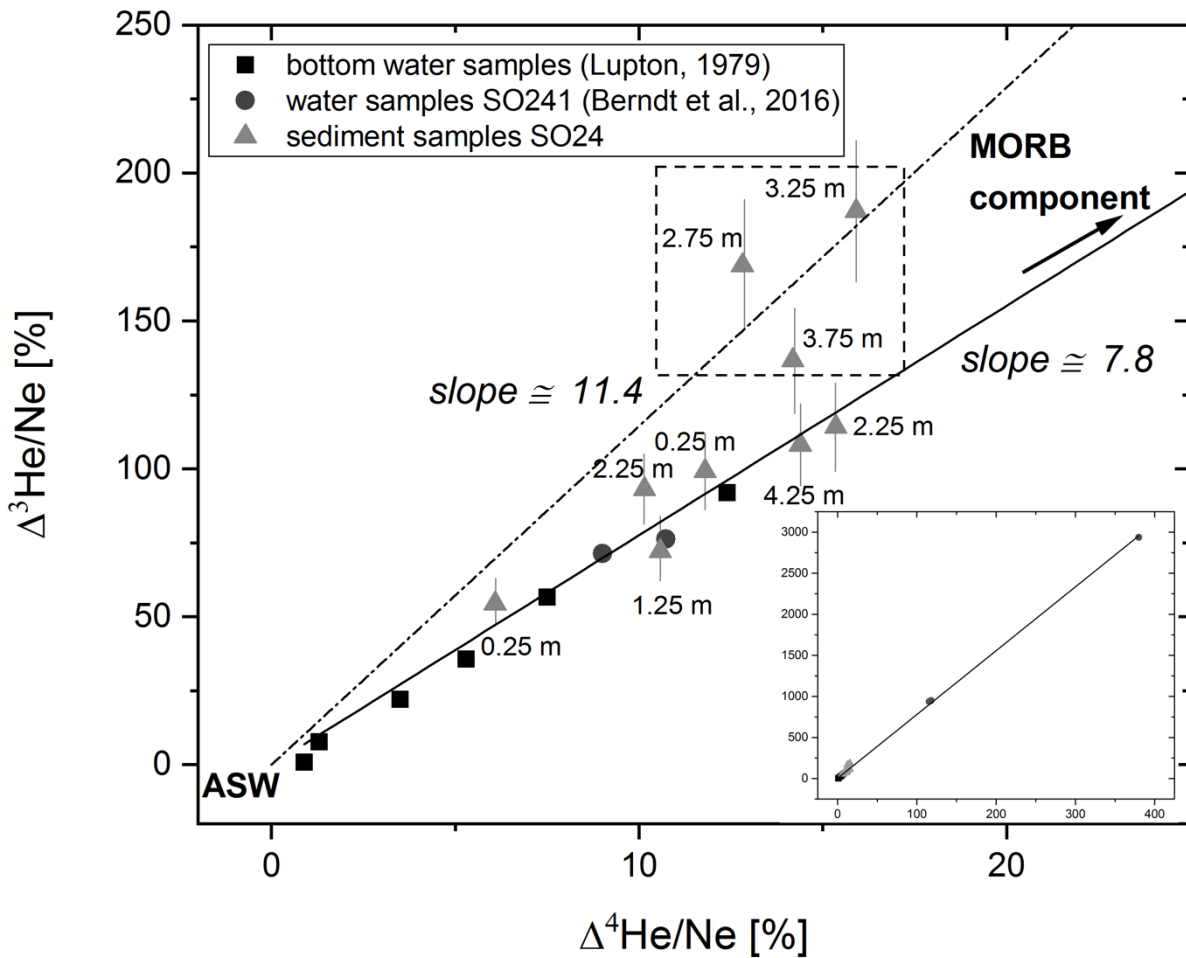


Fig 6: $\Delta^3\text{He/Ne}$ vs. $\Delta^4\text{He/Ne}$ (“excess helium”, for definition see section 5.2). The large graph shows a close-up section of the data discussed in this study, while the small graph in the lower right corner shows the values on a larger scale. The black line is a fit to the data of both Lupton (1979) and Berndt et al. (2016), and represents a mixing trend between ASW and the present day MORB component. The dashed square highlights three sediment pore water samples which do not lie on the mixing line. The dashed line is a fit to these three sediment pore water samples, representing injection of fluids with a higher $^3\text{He}/^4\text{He}$ ratio than today. We note that within the error bars the helium composition of the samples between 2.75 m and 3.75 m cannot be explained by binary mixing of ASW and hydrothermal component currently observed in the Guaymas Basin.

