Radioactive disequilibrium in sediments of the Guaymas Basin, Gulf of California/Sea of Cortés

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Porewater analyses on gravity cores collected 2014 from Guaymas Basin (ca 500-1800 m water depth) revealed high dissolved Ba in some cases. We are analyzing small subsamples from five of these cores to investigate the origin of the high Ba. Based on gamma spectrometry, ^{226}Ra is slightly elevated at all depths analyzed (to 150 - 350 cm), but activities do not exceed 8 dpm (g dry mass)$^{-1}$. We selected two of the gravity cores for further radiochemical analysis by chemical separations and alpha spectrometry. Both show low and nearly constant long-lived Th isotopes (^{230}Th, ^{232}Th) and substantial U-series disequilibrium (^{230}Th/^{238}U, ^{226}Ra/^{230}Th, and sometimes ^{210}Pb/^{226}Ra). Excess ^{238}U and ^{226}Ra require additions from the water column or another source, but maximum ^{238}U activities are only about 6 dpm (g dry mass)$^{-1}$.

We compare the above results with those obtained on two short (maximum 16 cm) submersible push-cores collected 2008 from the Guaymas deep basin. These cores came from sites of active venting, evidenced by high sediment temperatures and the presence of *Beggiatoa* mats. Both cores yielded high ^{226}Ra and ^{228}Ra, to ca 500 and 200 dpm (g dry mass)$^{-1}$, respectively. Radiochemistry on one push-core showed low and constant ^{230}Th and ^{232}Th and disequilibria as observed above, but at much higher amplitude. The water column is the only plausible source for excess U. We expect that further work will clarify the source of excess Ra.

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