

Trace metal and Cd isotope systematics of the basal Datangpo Formation, Yangtze Platform (South China) indicate restrained (bio)geochemical metal cycling in Cryogenian seawater

Figure S1:
SMS-19

SEM/BSD picture of layers of Mn carbonates (light grey) interbedded with detrital silicates (dark grey), sulphides (bright white) and OM (black)

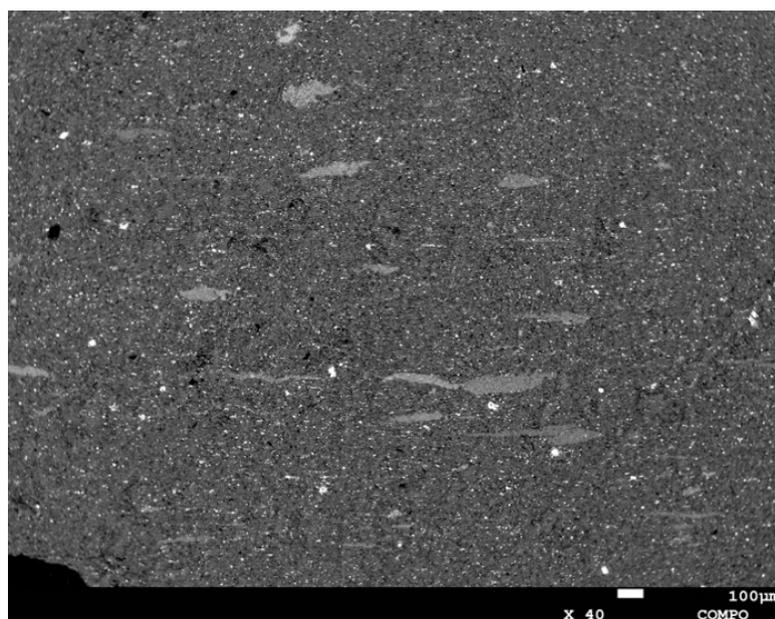
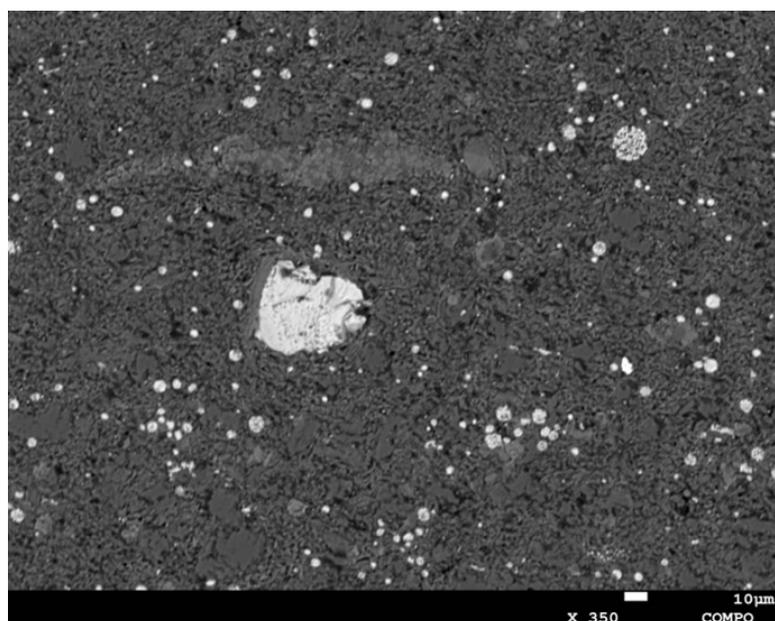


Figure S2:
SMS-19

SEM/BSD picture zoom reveals that idiomorphic, presumably diagenetic, sulphide grains (centre) are exceedingly bigger (>50 μm) than presumably authigenic framboidal sulphide grains (~10 μm)



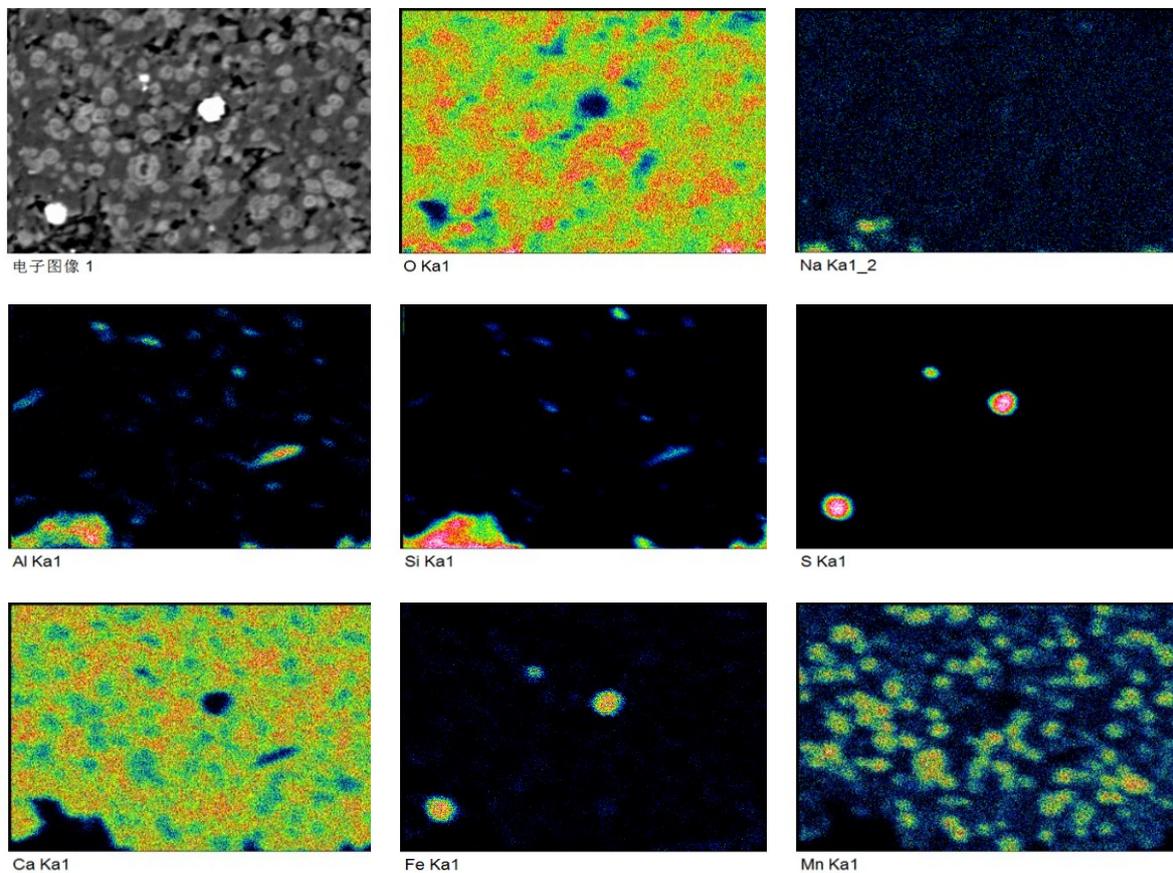


Figure S3: SMS-19 zoom in on Mn carbonate bed, shows two generations of Mn carbonates with differing relative Mn concentrations obtained by EDX mapping (map is 150x70 μ m).

Instrumental setup: Major-element semi-quantitative electron probe microanalyses of minerals were performed on a JEOL JXA-8230 equipped with an Oxford X-MaxN 20 IE250 EDX at the State Key Laboratory of Marine Geology, School of Ocean and Earth Sciences, Tongji University, Shanghai, PR China. The analyses used an accelerating voltage of 15 kV and a beam current of 10nA with a beam of 5 μ m diameter. Natural and synthetic mineral standards (SPI) were used to calibrate all quantitative analyses and a ZAF correction was used for the data reduction. The conditions for mapping analysis were as follows: accelerating voltage 15 kV, beam current 50-100nA, 2 μ m beam diameter, dwell time 10-15ms.

Figure S4: Comparison of Cd concentrations obtained by ICP-MS linear regression methods via standard calibration and Cd concentrations obtained by isotope dilution using the $^{106}\text{Cd}/^{112}\text{Cd}$ ratio in a mixed standard spike analyses and the $^{106}\text{Cd}/^{112}\text{Cd}$ ratio in our 106/108 Double Spike at MPI Mainz. Cd ID concentrations were about 74% of the results obtained by Cd ICP-MS standard calibration. The leachate colour and symbol code can be found in Fig. 4 in the main manuscript.

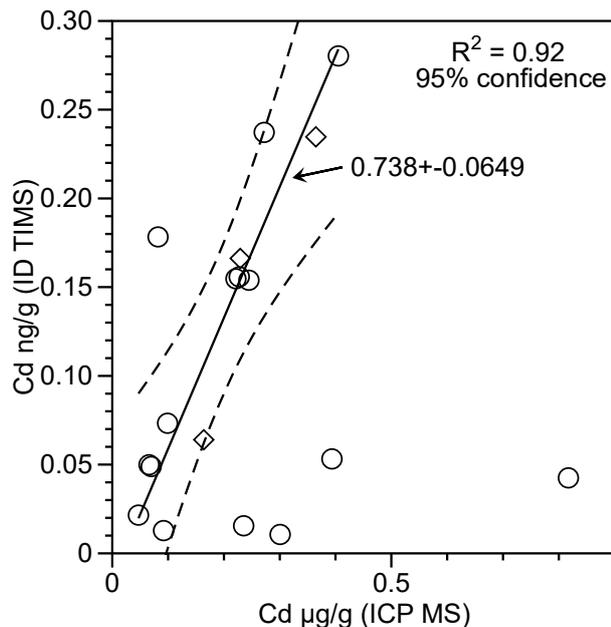


Figure S5: Influence of fluid-related alteration of Cd concentrations and isotope compositions in operational leachates (colour and symbol code as in Fig.4 in the main text). Ratios of Cd over fluid mobile Sr and fluid mobile Ba over conservative behaving Ti reveal no significant modification of Cd concentrations or Cd isotope fluid transport mechanism within the sediment. Low but variable oxygen isotope compositions obtained in carbonate do not correlate with Cd isotope compositions nor Cd concentrations further underlining the negligible influence of diagenetic fluid-like overprint of obtained Cd abundance/isotopy.

