EGU Galileo Conferences
GC5-Mass-59, 2019
Mass extinctions, recovery and resilience

Sedimentological and geochemical facies changes in the NE Paris Basin linked to the end-Triassic mass extinction event

Natascha Kuhlmann (1), Jean Thein (1), Sven-Oliver Franz (1), Robert Colbach (2), and Alain Faber (3)

(1) Institute for Geosciences and Meteorology, University of Bonn, Bonn, Germany (s.franz@uni-bonn.de), (2) Service géologique de l'Etat, Bertrange, Luxembourg (robert.colbach@pch.etat.lu), (3) Musée national d' histoire naturelle, Luxembourg, Luxembourg (afaber@mnhn.lu)

In the NE Paris Basin, upper Triassic and lower Jurassic sediments are widespread. The area, in which the sediments were deposited, was sensitive for changes of the sea level, paleogeography and paleoenvironment. A large number of complete sections from Luxembourg, NE France and W Germany show a wide variation of rapidly changing sediment facies from shallow marine to terrestrial. Detailed multidisciplinary studies have been conducted on these different sections to observe the variations of critical parameters characterizing the dramatic environmental changes, leading to the end-Triassic mass extinction. During this period, the opening of the Central Atlantic Ocean was accompanied by massive volcanism which released CO_2 and other gases in extreme volumes, leading to a greenhouse and negatively affected atmosphere, hydrosphere and biosphere. In the Paris Basin the asteroid impact of Rochechouart additionally deteriorated the ecological environment.
The geochemical composition reflects the lithology and allows furthermore a chemo-stratigraphical subdivision. The element patterns are also depending of the local depositional environment. Terrigenous elements can be discerned from biogenic, heavy mineral bound or diagenetically enriched elements. Redox-sensitive ratios play a significant role in the description of the redox-conditions in the sediment and water column. δ18O- and δ87Sr-analyses were used to give information about the temperature and salinity of the Rhaetian Sea.
Our δ13Corg vertical distribution data show prominent negative excursions occurring globally. They permit a worldwide stratigraphic correlation. A major negative peak is observed at the T/J boundary, above which stronger anoxic conditions replace the red beds of the uppermost Rhaetian.