

Physical geology and chemostratigraphy of
the Mandakpal Valley section in Kashmir,
India during the Late Permian and Early
Triassic periods

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The Permian Triassic Boundary (PTr) marks a global mass extinction event that occurred approximately at 252 Ma. The geologic record of this time reflects a global environmental crisis linked to the loss of 96% of marine species and 70% of terrestrial vertebrate families. It is believed large scale volcanism that occurred on land in the latitudinal region of present day Siberia had detrimental environmental impacts resulting in the tipping point leading to the End Permian biotic crisis. Large amounts of sulfur dioxide, carbon dioxide, dust and ash were released into the atmosphere by these eruptions. Terrestrial and marine habitat quality declined due to global temperature change, ocean acidification, acid rain, increased weathering, etc.

Here we present an integrated litho-chemostratigraphic reconstruction of the southern Neo-Tethys Ocean which includes a new section from Mandakpal (Kashmir, India). Like the Guryul Ravine section, Mandakpal records sedimentological evidence of increased storm intensities approaching the subaerial exposure of the shelf prior to the main extinction event. Elemental and isotopic data show changes in continental weathering accompanying increased intensification of euxinia on the shelf approaching the boundary. Restricted circulation of the Neo-Tethys towards the end-Permian and associated upwelling of anoxic waters onto the shelf appear to lag behind those observed in the more southern sections of Himachal Pradesh (Spiti Valley, India).