

## **Catastrophic Fluvial Response to Climate Aberrations- Characterizing the Paleocene/Eocene Thermal Maximum in the Wasatch Formation, Western Colorado, USA**

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At the Paleocene/Eocene boundary, a geologically instantaneous release of gas hydrates resulted in a global climate aberration. This event has been well documented in the marine record, characterized by an increase in ocean surface temperature of 4-8°C and a negative carbonate isotope excursion of 3-4‰. In the terrestrial environment, a mean annual temperature change of approximately 10°C has been documented in paleobotanical reconstructions, interpreted to correspond to an increasingly drier and more seasonal climate.

Based on sedimentological field observations from the Wasatch Formation of Colorado, I believe that this change resulted in catastrophic behavior of the fluvial system. Pollen data constrains the Paleocene/Eocene boundary to within the Molina Member of the Wasatch Formation, a high net-to-gross unit conformably bounded above and below by paleosol sequences. The Molina is characterized by a dramatic increase in sand deposition and out-of-channel flow exemplified by a basal 10 meter thick sand bench, flooding an area in excess of 50 kilometers from the trunk of the river system.

By further constraining the event through independent time correlation measures I hope to demonstrate the link between an increase in discharge and climatic change. Methods such as additional pollen analysis, fossil mammal zonation, and relative CO<sub>2</sub> changes through leaf stomata density will be used to date this event. We predict that the climatic aberration occurring at the Paleocene/Eocene boundary resulted in an increase in fluvial discharge and precipitation demonstrating a wetting, as opposed to drying, of this subtropical climate.