

## **A mixed clastic-carbonate lake margin succession from Triassic of East Greenland**

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Lake margin deposits are being increasingly studied, but this is often focussed on either clastic or carbonate/microbial dominated end members. This study examines the interaction of clastic and carbonate system from a dynamic lake margin. The Late Triassic Edderfugledal Member outcrops between 71° and 72° 40' N in East Greenland. Throughout the Late Triassic, lacustrine conditions predominated and deposition occurred in the largely closed, underfilled Jameson Land Basin which lay at approximately 30° to 40° north in Northern Pangea. Regular fluctuations in lake level, interpreted as a response to cyclic, orbitally forced climatic variance, resulted in a highly mobile lake shore zone. The response and interaction of both clastic and carbonate components of the shore zone environment to these fluctuations in lake level are documented in this study. The studied,  $\approx 10$  m thick, section which has been traced for over 4 km, lies within the transition between the carbonate dominated Sporfjeld Beds and the overlying Pingel Dal Beds which contain an increased clastic content.

During the deposition of the Edderfugledal Member, arid conditions prevailed leading to more ephemeral lacustrine developments and low sediment input. Extensive post depositional disruption occurred with there being evidence for desiccation, pedogenic processes and evaporite precipitation. These effects increase towards the lake margins where exposure was most regular and most prolonged. Up section, increasingly humid conditions led to the formation of longer lived lacustrine developments and increased clastic sediment input. During the transgressive phases of individual climatically driven cycles, sediment input was pushed back to the lake margin allowing extensive microbialite development. Ooidal shoals developed in shallow water beyond the extend of clastic input. The lakeward migration of the ooidal shoals and the progradation of clastic systems eventually stifle the microbialites prior to the next transgressive event.

In a mixed clastic-carbonate lacustrine setting the interaction of sediment supply and production are key factors in governing facies development and these are in turn predominantly controlled by lake level dynamics and lake margin bathymetry.