

## **From rifting to orogeny; using sediments to unlock the secrets of the Greater Caucasus**

Stephen Vincent (1), Li Guo (1), Vladimir Lavrishchev (2), James Maynard (3), and Melise Harland (4)

(1) CASP, Cambridge, United Kingdom (stephen.vincent@casp.cam.ac.uk), (2) Kavkazgeols'emka, Yessentuki, Russia, (3) ExxonMobil International Ltd., Leatherhead, United Kingdom, (4) Getech, Leeds, United Kingdom

The western Greater Caucasus formed by the tectonic inversion of the western strand of the Greater Caucasus Basin, a Mesozoic rift that opened at the southern margin of Laurasia. Facies analysis has identified fault-bounded regions of basinal, turbiditic and hemipelagic sediments. These are flanked by areas of marginal, shallow marine sediments to the north and south. Subsidence analysis derived from lithology, thickness and palaeowater depth data indicates that the main phase of rifting occurred during the Aalenian to Bajocian synchronous with that in the eastern Alborz and, possibly, the South Caspian Basin. Secondary episodes of subsidence during the late Tithonian to Berriasian and Hauterivian to early Aptian are tentatively linked to initial rifting within the western, and possibly eastern, Black Sea, and during the late Campanian to Danian to the opening of the eastern Black Sea.

Initial uplift, subaerial exposure and sediment derivation from the western Greater Caucasus occurred at the Eocene-Oligocene transition. Oligocene and younger sediments on the southern margin of the former basin were derived from the inverting basin and uplifted parts of its northern margin, indicating that the western Greater Caucasus Basin had closed by this time. The previous rift flanks were converted to flexural basins that accumulated thick, typically hemipelagic and turbiditic sediments in the early, underfilled, stage of their development. A predominance of pollen representing a montane forest environment (dominated by Pinacean pollen) within these sediments suggests that the uplifting Caucasian hinterland had a paleoaltitude of around 2 km from Early Oligocene time. The closure of the western Greater Caucasus Basin and significant uplift of the range at c. 34 Ma is earlier than stated in many studies and needs to be incorporated into geodynamic models for the Arabia-Eurasia region.