

## Connecting America and Russia: Eocene erosion across the Arctic

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The structural evolution of the Arctic Ocean and its surrounding continental areas is still poorly constrained, due to ice coverage and inaccessibility. The only scientific coring campaign within the central Arctic Ocean (the ACEX project) was positioned on the Lomonosov Ridge. This is a pronounced geomorphic structure of presumably continental origin, which stretches across the entire Arctic Ocean between the northernmost margin of the North American continent (Ellesmere Island) and the Siberian Shelf, bordering the New Siberian Islands. Geophysical data suggest that the Lomonosov Ridge may be continuous with the Siberian and Ellesmerian continental margins (e.g., Poselov et al., 2011). Rather unexpectedly, the ACEX project revealed that the Lomonosov Ridge was in very shallow water or even exposed to erosion between ~44 and 18 Ma. As an explanation, it was suggested that the Lomonosov Ridge experienced compressional tectonics at that time, which may have affected the entire central Arctic Ocean, propagating from North America towards the Siberian shelf (O'Regan et al., 2008). Here we present the first low-temperature thermochronological data from northern Ellesmere Island and from the New Siberian Islands, recording the erosion and exhumation history of these areas. Our apatite (U-Th)/He data show that while southern and central Ellesmere Island was characterized by very slow erosion during the Cenozoic, northern Ellesmere Island bordering the Arctic Ocean experienced km-scale erosion during the Eocene, contemporaneously with the stalled subsidence / uplift period of the Lomonosov Ridge. The thermochronology data from the New Siberian Islands reflect a complex erosion history: the eastern part of the North Siberian Islands, the DeLong Island Group, experienced rather limited erosion during the Cenozoic and most of the Mesozoic. By contrast, data from the western New Siberian Islands – the Lyakhov Island Group – in direct continuation of the Lomonosov Ridge are again in agreement with rapid Eocene erosion, although less pronounced than Eocene erosion on northern Ellesmere Island. In summary, our data show that large parts of the Arctic realm share a common erosion history and were being exhumed during the Eocene.

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Poselov, V., Butsenko, V., Chernykh, A., Glebovsky, V., Jackson, R., Potter, D., Oakey, G., Shimeld, J., Marcussen, C., 2011. The structural integrity of the Lomonosov Ridge with the North American and Siberian continental margins. *ICAM VI Proceedings*, 233-258.