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**Pliocene landscape and environmental evolution in the  
Canadian Arctic: when was the Beaufort Formation  
incised?**

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It has been hypothesized that the Pliocene Beaufort Formation once formed a contiguous 1200 km-long coastal plain along what is now the western Canadian Arctic Archipelago. Today, the deposit is broken by inter-island straits and fiords. The timing and causes of the deposition and incision of the Beaufort Formation are potential clues to the changes that occurred leading up to the Late Pliocene “climate crash”. The climate crash was preceded by an anomalously warm excursion where global temperatures were similar to the warming that is predicted for the 21st century. Cosmogenic nuclide burial dating will be used to test whether a global sea-level fall, local tectonics, or local ice sheets were responsible for the dramatic incision of the Beaufort Formation (a sea-level fall would result in synchronous incisions, whereas tectonics or ice sheets would cause diachronous incisions). These landscape evolution hypotheses need to be tested before we can begin

to understand the impact of climate change on the Arctic.

Furthermore, the Beaufort Formation is laden with well-preserved peat, wood, and vertebrate fossils (e.g., beaver and camel) which indicate a high Arctic boreal forest ecosystem. However, because the records are poorly dated, it is impossible to distinguish if temporal (e.g., climatic) or spatial (e.g., latitudinal, sea ice distribution) variations are the cause for differences in estimated mean temperatures and seasonality from various deposits. New cosmogenic nuclide burial dating of sands that bracket previously studied peat will improve our ability to correlate the isolated paleoclimate records on different islands and test other hypotheses regarding the feedbacks and links of the paleoenvironmental changes to global and regional paleoclimate, sea ice, and paleoceanographic changes. Additionally, the new geochronology will provide a means to estimate rates of incision and sediment flux to the Beaufort Shelf at particular times.