

Comparing Petrographic and Paleo-hydraulic Methods for Estimating of Paleo-drainage Basin Size: an example from the Cretaceous and Tertiary Bonnet Plume Basin (NTS 106E) Yukon

Darrel G. F. Long¹, and Jordan Mathieu²

¹Mineral Exploration Research Centre, Department of Earth Sciences, Laurentian University, Sudbury, Ontario, Canada

²Department of Earth Sciences, Laurentian University, Sudbury, Ontario, Canada

Abstract

One of the key problems in understanding the evolution of terrestrial clastic depositional basins is estimating the size of the catchment area. This can be done using a variety of field observations of sedimentary structures, including cross-bed thickness and direction, channel and storey thickness and channel dimensions. These are used to predict flow velocity, mean annual and bank-full discharge, sinuosity, meander wavelength and ultimately drainage basin size. The mathematical products of these observations can be directly tested using petrographic analysis of sand and gravel grade clasts that have survived erosion and transport from the source area. This is especially practical in areas where the basin is surrounded by a broad range of rock types.