ABSTRACT

TITLE:	U/Pb Ages of Detrital Zircons from the Archean Jardine Metasedimentary Sequence; Northern Yellowstone National Park, Wyoming
AUTHOR(S):	Kraushaar, Sabina
PRESENTED AT:	6th Annual Natural & Behavioral Sciences Undergraduate Research Symposium Program, Fort Lewis College, 2011

ABSTRACT: The Wyoming craton is a thick package of Archean rocks, made up of schists, gneisses and igneous intrusions. Because these rocks were formed so long ago, little is known about their specific origins. The Jardine Metasedimentary Sequence (JMS), part of the Wyoming craton, in northwestern Yellowstone National Park, Wyoming, consists of schists that exhibit low-grade metamorphism. These schists contain diagnostic metamorphic assemblages including chlorite-biotite in the western portion of the study area, increasing in grade to garnet-andalusite-chlorite-biotite and garnet-staurolite-biotite further to the east (Osborne, et al, 2011). The JMS was likely deposited as a submarine fan in an active continental margin based on sedimentary structures and geochemistry (Thurston, 1986). The JMS was intruded by two major granitic plutons (Hellroaring and Crevice) and a variety of felsic and mafic dikes, sills and stocks. U/Pb dating on detrital zircon from the JMS show an array of zircon ages, with 3.596 (+/- .005) Ga being the oldest, and 2.959 (+/- .007) Ga being the youngest. The age of deposition of the JMS can be constrained to later than 2.959 (+/- .007) Ga, but before the intrusion of the igneous plutons at 2.808 (+/- .010) Ga (Ware, et al, 2011). Provenance for the detrital zircon grains in the JMS might be interpreted as the Archean Pilbara (Australia) and Kaapvall (South Africa) cratons, whose zircons share the same ages as those in the JMS. These detrital zircons support an interpretation that the Wyoming craton was adjacent to the Pilbara and Kaapvaal cratons sometime between 2.9 and 2.8 Ga.