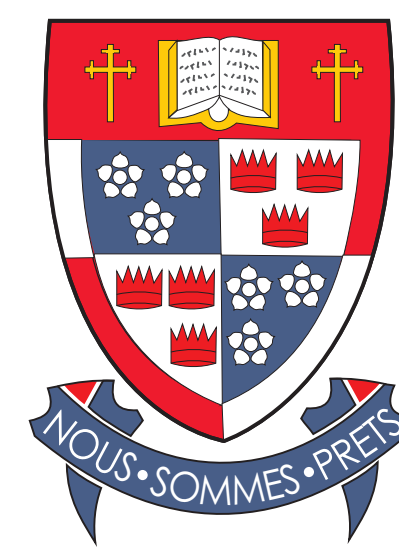


New studies of the Lower Cretaceous sedimentary strata on the southern margin of Nechako Basin - progress and preliminary observations



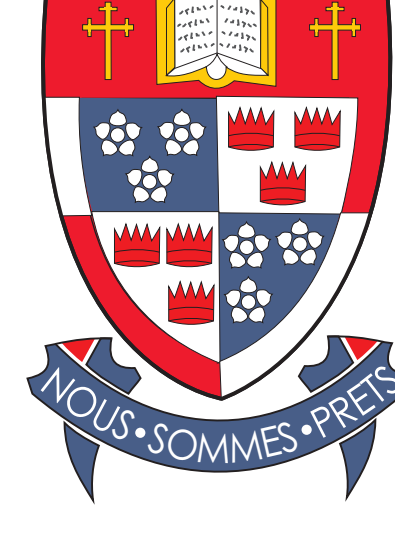
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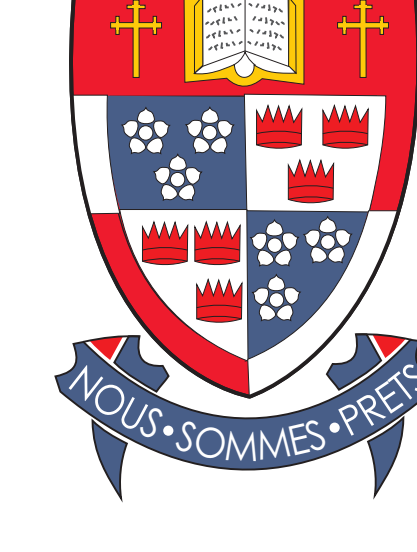
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South of the synclorium in the Nemaia Mountain area, across a series of high angle faults, strata of probable Albian age are exposed on the northern flanks of Mt. Tatlow map (locality C on the geology map figure). This unit consists of black silty mudstone, lithic sandstone, and chert-pebble conglomerate that unconformably overlies the Upper Jurassic Relay Mountain Group. These rocks have been assigned to the **Beece Creek succession** of the lower-upper Cretaceous Taylor Creek Group in several previous studies and published geologic maps (e.g., Schiarizza and Riddell, 1997; Schiarizza et al., 2002). Preliminary stratigraphic analysis indicate these strata conformably overlie both the middle to late Albian Dash and Lizard formations of the Taylor Creek Group, and that these strata may be directly correlative to part of the Jackass Mountain Group on Nemaia Mountain. If this interpretation is correct, this correlation would provide the earliest definitive tie between the Methow and Tyaughton basins, and would substantially increase the extent of the regional Early Cretaceous depocentre.

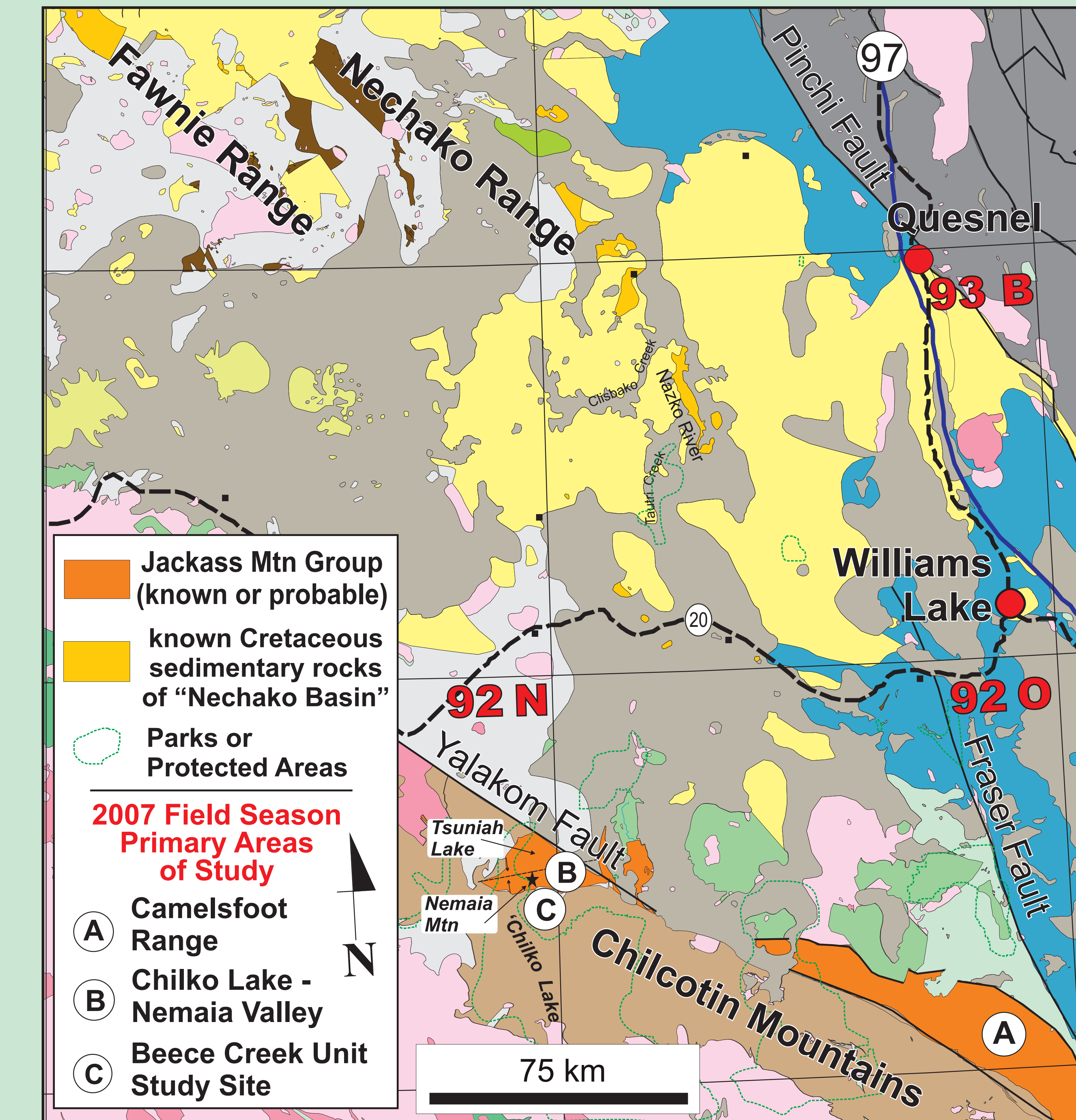


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Univ. Wisconsin - Eau Claire

The well-exposed stratigraphic section on the northern flanks of Mt. Tatlow is being examined in detail as part of a 4th year B.Sc. project (M. Forgette, Univ. Wisconsin – Eau Claire). The section has been measured in detail and extensively sampled for thin section petrography, shale geochemistry, detrital zircon analysis, palynological and microfaunal studies and total organic carbon.

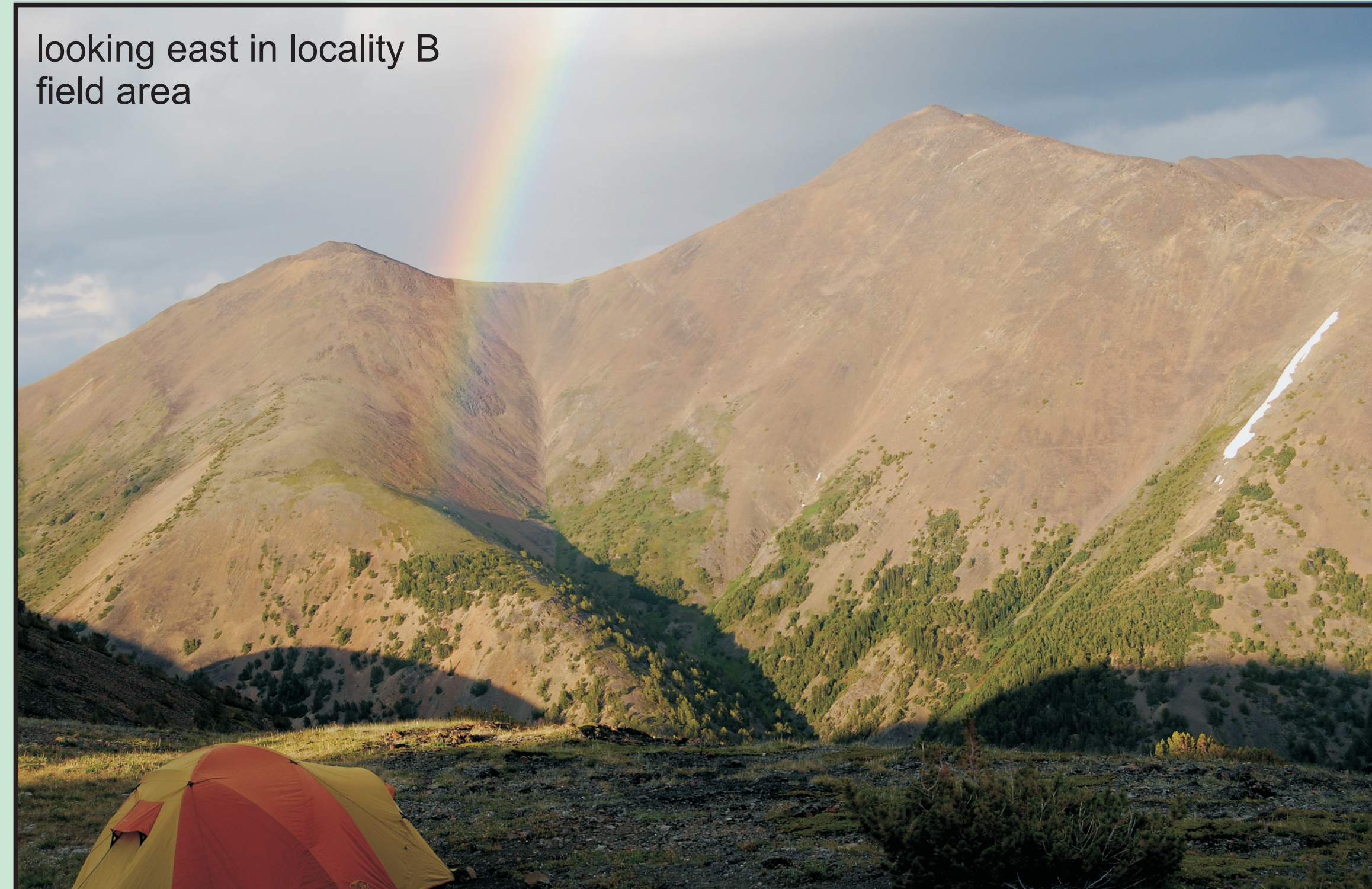
Summary

The 2007 field season focussed on detailed field investigations, measurement of stratigraphic sections, and sample collection as part of two studies of well-exposed Lower Cretaceous Jackass Mountain Group (JMG) strata in the Nemaia Mountain and Camelsfoot Range areas (detailed on separate posters). In both major study areas, we document extremely thick facies intervals interpreted to represent shallow marine and non-marine environments. The presence of significant thicknesses of shallow marine and terrestrial units within the JMG increases support for correlation of this unit with similar subsurface Lower Cretaceous strata of the Nechako Basin. Shallow marine sandstones in particular are likely to serve as well-sorted and laterally extensive units with sufficient porosity and permeability to act as high volume reservoir units for significant hydrocarbon accumulation. As well, this correlation expands greatly the extent of potential source rocks for the subsurface strata. In addition, initial sampling was conducted for more regional studies of Lower Cretaceous units in adjacent areas. Sampling of Lower Cretaceous strata in the areas between the Camelsfoot Range and Chilko Lake region was initiated to compare the detrital zircon and other geochemical characteristics of these strata to those of the main study areas, and to test previously published interpretations that Methow and Tyaughton basins were distinct subbasins during Early Cretaceous time. South of the Nemaia Mountain area, across a series of high angle faults, strata of probable Albian age are exposed on the northern flanks of Mt. Tatlow. This unit consists of black silty mudstone, lithic sandstone, and chert-pebble conglomerate that unconformably overlies the Upper Jurassic Relay Mountain Group. These rocks have been assigned to the Beece Creek succession of the lower-upper Cretaceous Taylor Creek Group in several previous studies and published geologic maps. A well-exposed stratigraphic section through this unit has been measured in detail and extensively sampled for thin section petrography, shale geochemistry, detrital zircon analysis, palynological and microfaunal studies and total organic carbon. Preliminary stratigraphic analysis indicate these strata conformably overlie both the middle to late Albian Dash and Lizard formations of the Taylor Creek Group, and that these strata may be directly correlative to part of the Jackass Mountain Group on Nemaia Mountain. If this interpretation is correct, this correlation would provide the earliest definitive tie between the Methow and Tyaughton basins, and would substantially increase the extent of the regional Early Cretaceous depocentre.



Regional geological location map showing major Cretaceous units of Nechako, Methow and Tyaughton basins and the outlined area of the regional geology map of Figure 2 (modified from B.C. Ministry of Energy, Mines and Petroleum Resources, 2002; used with permission)

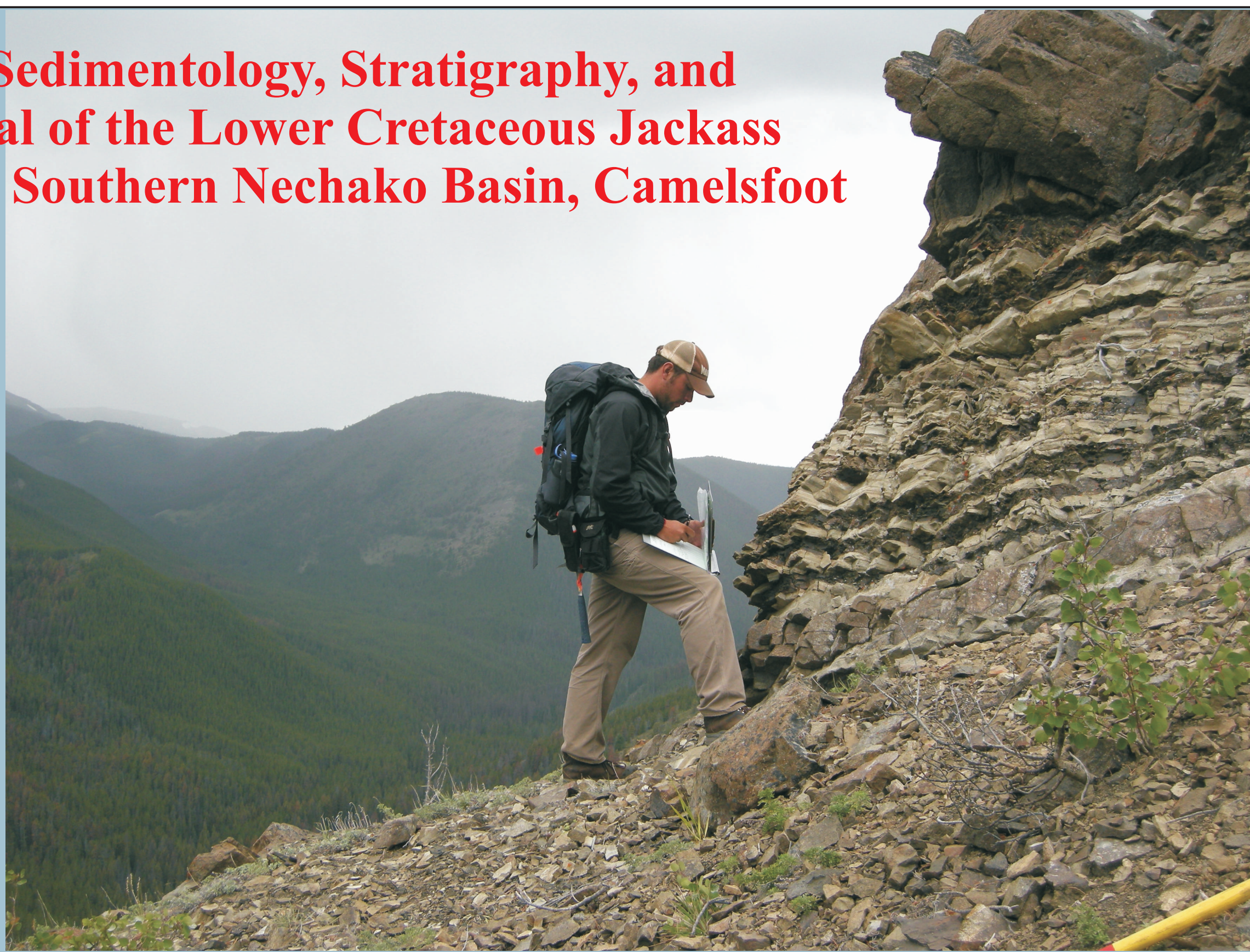
At the southern end of the Nechako Basin, Lower Cretaceous Jackass Mountain Group (JMG) strata are unconformably overlain by Neogene volcanic rocks. They are generally classified as part of the Methow Basin, but are clearly the surface expressions of strata that continue northward into the subsurface beneath the Tertiary rocks which form most of the exposed strata of the Nechako Basin (Hickson et al., 1994. Mahoney et al., in review). The JMG and associated strata include thick (1000's m), laterally extensive (10's km) marine sandstone successions that overlie and interfinger with marine mudstones. However, the three dimensional architecture of the stratigraphy is very poorly constrained, and therefore the subsurface facies distribution is unknown. Previous studies have interpreted them as the deposits of large submarine fan deposystems (e.g. Kleinspehn, 1982, 1985). However, these previous studies have been primarily "first order" stratigraphic assessments commonly associated with government regional mapping projects and precede a large number of studies over the last 15 years which have greatly enhanced the understanding of submarine fan sedimentation models (e.g. Bouma, 2000).



M.Sc. Research Projects

Russell Goodin: Sedimentology, Stratigraphy, and Reservoir Potential of the Lower Cretaceous Jackass Mountain Group, Southern Nechako Basin, Camelsfoot Range, B.C

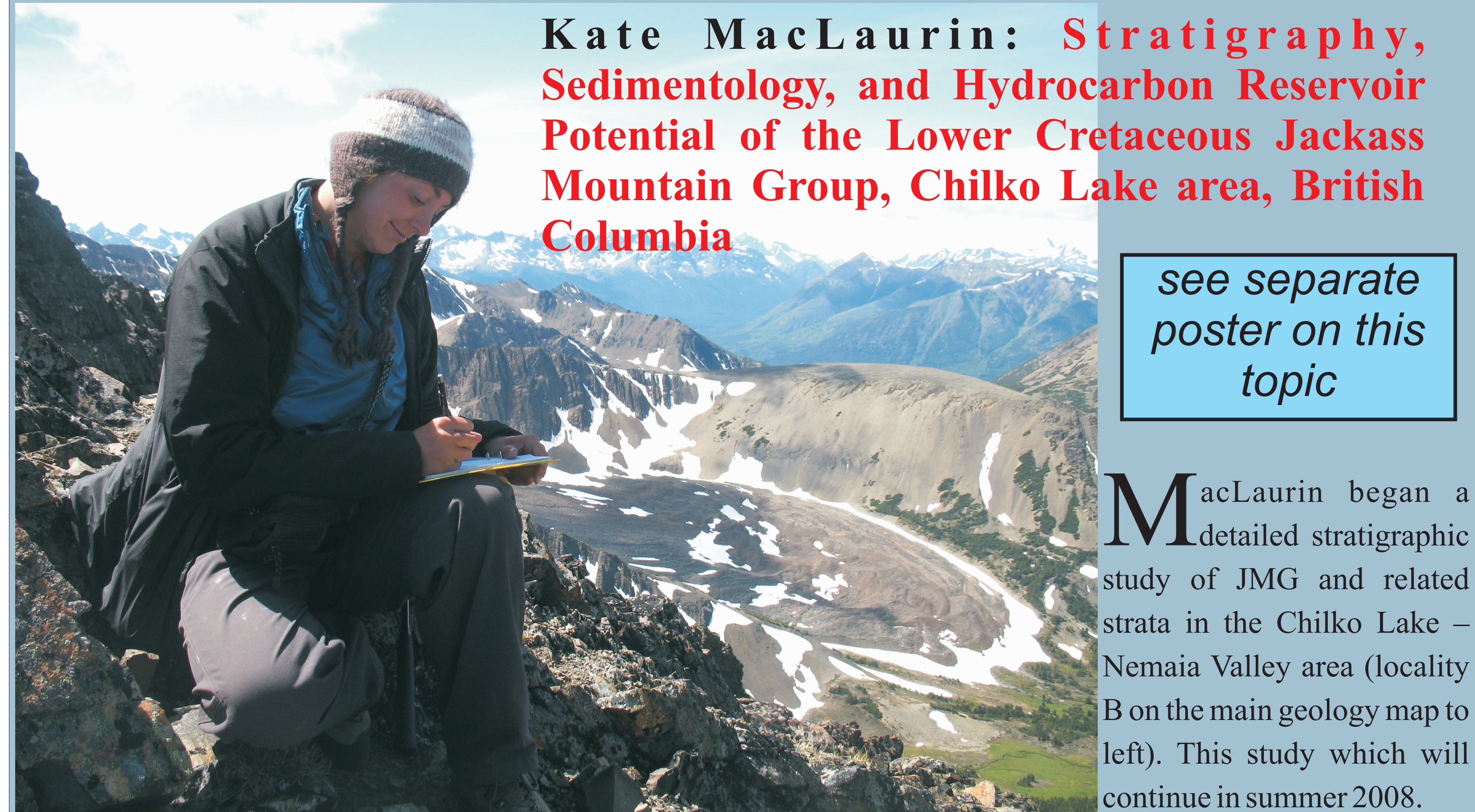
see separate poster on this topic



During summer 2007, Goodin conducted a detailed examination of sections of the JMG in the Camelsfoot Range (Locality A on main geology map at left). Within this study area, five detailed stratigraphic sections were measured. Forty five lithologic, 10 detrital zircon, 12 mudstone geochemistry, 11 microfossil, and 3 macrofossil samples were collected, most from the stratigraphic sections. Processing of these sample and detailed petrographic description of 20 sandstone thin sections during the winter of 2007 / 2008 will provide further constraints on the study area geology. Preliminary interpretations indicate that much of the Jackass Mountain Group in the study area consists of strata deposited in non-marine fluvial, deltaic and shallow marine pro-delta environments in addition of submarine fan successions. This contrasts previous interpretations which suggest all or most of the JMG are submarine fan deposits. The wide range of depositional environments and facies association types documented in the outcrop area suggests a wider range of possible correlative facies associations in the subsurface to the north need to be considered as possible Jackass Mountain Group equivalents.

Kate MacLaurin: Stratigraphy, Sedimentology, and Hydrocarbon Reservoir Potential of the Lower Cretaceous Jackass Mountain Group, Chilko Lake area, British Columbia

see separate poster on this topic



During the summer of 2007, work on four of the stratigraphic sections was initiated. Extensive sampling of rock types keyed to stratigraphic position will facilitate detailed petrologic, organic maturation, and porosity/permeability analyses. Approximately 70 lithologic samples, distributed between the four measured sections, were collected for petrologic analyses. Ten detrital zircon sandstone samples and 17 mudstone geochemical samples were collected for isotopic provenance studies. Ten sandstone samples are being cut for thin sections which will be supplemented with new samples collected in the 2008 field season to provide a comprehensive petrographic description of the sandstone facies. Continued field work during 2008 will consist of identification and measurement of other representative stratigraphic samples and continued collection of samples for geochemical and lithologic analysis. Preliminary interpretations suggest that the JMG in this area was dominantly deposited in shallow marine environments, with only minor submarine fan deposition.

B.Sc. Research Project

