Abstract

Significant successions of Jurassic to Early Cretaceous strata that are believed to be the southern surface continuation of the Nechako Basin were deposited on the accreted Cadwallader, Bridge River, and Methow terranes. These geographically separate sedimentary successions have been interpreted as an overlap assemblage and are traditionally referred to as the Methow and Tyaughton basins. The deposition of these shes a firm link of the disparate underlying terranes by Late Cretaceous time. Our objective is to establish an Early Cretaceous link between the geographically separate Methow and Tyaughton outcrop regions. We test the idea that they formed as part of one basin by using detailed sedimentologic, geochemical, and geochronological analyses of the Lower Cretaceous Jackass Mountain Group (JMG) and the Lower-Upper Cretaceous Taylor Creek Group (TCG) that were deposited within the Methow and Tyaughton "basins", respectively.

Near Chilko Lake in south-central British Columbia. the JMG and the TCG are exposed southwest of the dextral Yalakom Fault. The rocks of the JMG are exposed in a majo northeast-trending synclinorium and unconformably overlie the middle Jurassic Nemaia Formation and mid- to late Jurassic Relay Mountain Group. The TCG is exposed as a south-dipping monocline 10 km southeast of the JMG syncline, across the Konni Lake Fault, and also unconformably overlies the Jurassic Relay Mountain Group

The JMG in the northern limb of the syncline is interpreted as shoreface to shelf deposits while the southern limb consists of a distal assemblage of shelf and turbiditic deposits The TCG is interpreted to represent delta plain to delta front sedimentation. A direct vertical or lateral linkage of lithofacies between the JMG and TCG sections is not possible owing to an unknown stratigraphic thickness/distance between the two units Geochemical analyses of the JMG appear to be distinct from the TCG, implying that the units do not have similar source regions, however, a strong overlap in REE pattern uggest both sections may share a similar provenance throughout their histories. Detrita zircon analyses show a distinct break between a unimodal and a bimodal signature in the upper JMG and lower portion of the upper TCG, suggesting this distinct break forms an important line of correlation between the two sections. Sedimentologic, geochemical, and geochronologic analyses, in addition to ongoing palaeontologic and palynologic analysis may establish an Early Cretaceous link within the unified Methow-Tyaughton Basin.

Introduction

The lower Cretaceous Jackass Mountain Group of the northern Methow terrane forms a thick sequence of clastic sedimentary strata exposed at the southern end of the Chilcotin Plateau. Regional structural patterns suggest these rocks dip beneath the Plateau, and may represent a potentially important hydrocarbon reservoir.

This project is designed to constrain the stratigraphic framework and basin architecture of the Jackass Mountain Group and laterally adjacent strata (Figure 1). These basinal characteristics will be constrained by:

1.Documentation of lateral and vertical sedimentologic and stratigraphic variations 2.Detrital zircon provenance analysis 3.Geochemical analysis

4.Regional facies reconstruction





 ∞ pebble/gravel lag

inverse gradation

and Petroleum Resources, Geoscience Map 2002-3, scale 1:50 000.144. In: Geoscience BC Summary of Activities 2007.

Research and Sponsored Programs.

Deposition within the Methow-Tyaughton basin was active during the Mesozoic and is composed of dominantly Jurassic to Cretaceous sedimentary and volcanic rocks that unconformably overlie arc-related sedimentary, volcanic, and metamorphic rocks of the Paleozoic to Triassic. During the Jura-Cretaceous, the Insular Terrane was approaching and docking to the western edge of the Intermontane Terrane. The Bridge River Ocean lay between the approaching Insular volcanic island arc and the Intermontane Terrane. The Insular Terrane had an east- dipping subduction zone on its western boundary but a passive margin on its east. Deposition occurring along this passive margin and across the Bridge River Ocean is thought to be deposited in the