

June 2020 – CSUR’s Technical Webinar

Depositional setting and stratigraphic framework of the Lower Triassic Montney Formation, northeastern British Columbia

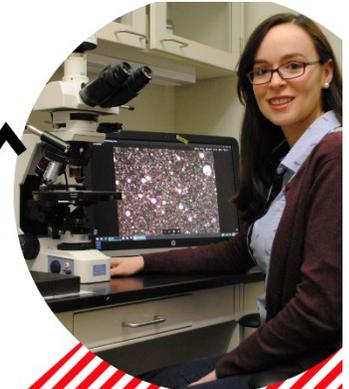
Patricia Gonzalez, a Ph.D. candidate at the University of Alberta, was on hand to present her work on the Depositional Setting and Stratigraphic Framework of the Lower Triassic Montney Formation in NE BC. This presentation provided additional detail and supplemented the core that Patricia presented at CSUR’s Advanced Technology & Core Workshop in September 2019.

The presentation delved into the detail process and methodology that was utilized in providing the additional elements required to reduce uncertainties and identify the subtle facies changes throughout the study area. The in-depth integrated study involved looking at 38 cores, tying it to well log data and using petrographic, SEM & XRD analysis to ascertain specific mineral content and high-resolution XRF to improve stratigraphic correlations. As indicated by the speaker, the study led to the identification of 12 lithofacies, 3 facies associations and the establishment of a depositional model.

Finally, it is possible and likely that the results of this study have laid the groundwork and provided the protocols for an extended regional study, perhaps even into NW Alberta. In addition, it would also be possible (& very fascinating) to further extend the scope of the study to include aspects such as the subsequent completion practices and of course the resulting production profiles to associate the identification of the facies to the performance of the wells.



TECHNICAL
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SERIES



**"DEPOSITIONAL SETTING AND
STRATIGRAPHIC FRAMEWORK OF THE
LOWER TRIASSIC MONTNEY
FORMATION, NORTHEASTERN BRITISH
COLUMBIA"**

By Patricia Gonz ales, University of Alberta

ABSTRACT: Patricia D. Gonz alez¹, Carolyn M. Furlong¹, Murray K. Gingras¹, Tiffany Playter^{1,2}, John-Paul Zonneveld¹.

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The Lower Triassic Montney Formation is known as a world-class unconventional petroleum reservoir system. It records sediment accumulation in a variety of depositional settings across the basin, including: siliciclastic shoreface, mixed clastic-carbonate ramp, turbidites, deltas and biostromes (Zonneveld and Moslow, 2018). In northeastern British Columbia, hydrocarbon production occurs mainly from fine- to coarse-grained siltstone reservoirs. In this area, the lithostratigraphy and stratigraphic framework of the formation are poorly understood due to complexities associated with subtle grain-size and lateral-facies variation, diminutive biogenic structures, and distribution of local discontinuities. The integration of different data sets (e.g. core descriptions, wireline logs, geochemical data, thin section analysis, SEM

analysis, among others) is important to help identify mineralogical changes and stratigraphic surfaces that aid in the interpretation and correlation of predominantly fine-grained successions, such as the Montney Formation in northeastern BC.

In this study, based on detailed core examination, twelve lithofacies and three recurring facies associations were identified within the Montney Formation, and were interpreted to represent deposition between distal offshore and lower shoreface settings, along a storm-dominated mixed siliciclastic-carbonate ramp. Sedimentological evidence suggests the area was influenced by ephemeral rivers delivering sediment to the basin, which may have constituted an important sediment source in the area. Trace fossil assemblages are characterized by low ichnodiversity and small size trace fossils, as a result of severe environmental conditions associated with the aftermath of the Permian-Triassic extinction event. Moreover, size diversity index values show an increasing upward trend, likely reflecting improved oxygenation conditions during the Spathian.

Three third-order sequences were recognized throughout the study area. In distal portions of the basin the contacts are conformable and facies changes are subtle, challenging the recognition of the sequence boundaries. However, detailed core-to-log calibrations are proven essential for the proper identification and regional correlation of significant stratigraphic surfaces. Understanding the lateral-facies variability and overall stratigraphic framework of the Montney Formation in northeastern BC, is key in defining and correlating new potential hydrocarbon reservoirs in the area.

References

Zonneveld, J-P., and Moslow, T.F. 2018. Palaeogeographic setting, lithostratigraphy, and sedimentary framework of the Lower Triassic Montney Formation of western Alberta and northeastern British Columbia. *Bulletin of Canadian Petroleum Geology*, v. 66 (1), p. 93-127.

Acknowledgements

The authors acknowledge the financial support of Geoscience BC, Canbriam Energy Inc., Birchcliff Energy Ltd, Progress Energy Canada Ltd, Sasol Canada, Shell Canada Ltd., and TAQA North Ltd. Additional financial support was provided by a National Sciences and Engineering Research Council of Canada Collaborative Research and Development grant (NSERC-CRD) awarded to J-P. Zonneveld and M.K. Gingras.

PRESENTER: Patricia Gonzáles, University of Alberta

Patricia González is a PhD student at the University of Alberta, currently working on the sedimentology and stratigraphic architecture of the Early Triassic Montney Formation, Western Canada Sedimentary Basin, under the supervision of Dr. John-Paul Zonneveld. Previous research has focused on interpreting the sedimentology and stratigraphy of different Cenozoic mixed siliciclastic-carbonate successions of Western Venezuela, integrating surface and subsurface data sets. Patricia received a Bachelor's Degree in Geological Engineering and an MSc in Geological Sciences from the Central University of Venezuela.



The graphic is a promotional poster for a CSUR technical webinar. It features a central image of a laptop with a red banner at the top that reads 'CSUR PRESENTS: CSUR TECHNICAL WEBINAR'. Below the banner, it specifies the date and time: 'June 21, 2020 | 10:00 am - 12:45 pm' and notes that 'pre-registration is mandatory'. To the right of the laptop, the title of the webinar is listed: 'Depositional setting and stratigraphic framework of the Lower Triassic Montney Formation, northeastern British Columbia', followed by the presenter's name: 'By Patricia D. González, University of Alberta'. At the bottom right, there is a red call to action: 'Sign Up Now !!' and a URL for more information and registration: 'https://www.csur.com/events/'. The CSUR logo is visible in the bottom left corner of the graphic.