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**GEOLOGICAL SURVEY OF CANADA  
OPEN FILE 8472**

**U-Pb zircon ages of volcanic ashes integrated with ammonite  
biostratigraphy, Fernie Formation (Jurassic), Western  
Canada: supplementary data files**

**D.I. Pană, T.P. Poulton, and L.M. Heaman**

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# **U-Pb zircon ages of volcanic ashes integrated with ammonite biostratigraphy, Fernie Formation (Jurassic), Western Canada: supplementary data files**

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Publications in this series have not been edited; they are released as submitted by the author.

## **Contents**

Summary

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Data Files:

- (1) U-Pb raw data: ICPMS (Tables 2-7), ID-TIMS (Table 8), Concordia plots and selected ages of volcanic and plutonic rocks that overlap within error with the ages of Fernie volcanic ashes for plot in Figure 9 (Table 9);
- (2) Selected ages of volcanic and plutonic rocks with error smaller than 5 Ma for plots in Figure 8;
- (3) \*CSV filed with Early, Middle, and Late Jurassic ages of Cordilleran volcanic and plutonic rocks downloaded from the GSC Geochronology Knowledgebase (2013: <http://atlas.gc.ca/geochron/en/>).
- (4) ArcMap \*mxd project and shapefiles with selected igneous rocks for each Jurassic Epoch from the Canadian Geochronology Knowledgebase (2013: <http://atlas.gc.ca/geochron/en/>), plotted in Figure 9a, 9b, and 9c.

## **Summary:**

This Open File report contains supplementary data files in support of a U-Pb zircon study of volcanic ashes by Pana et al. (2018).

## **Abstract:**

The Jurassic system of the Western Canada Sedimentary Basin records the transition in its tectonic setting from a "passive" back-arc platformal basin to a foreland basin at the western margin of ancient North America. In the accompanying report (Pana et al., 2018), we report new U-Pb zircon ages from bentonite layers and from probable volcanic ash components of clastic detritus in other strata of the Fernie Formation, which encompasses most of the Jurassic in the western portions of the basin and which

is now deformed in the Rocky Mountain fold-and-thrust belt. The bentonite ages come from the lower Nordegg Member (Pliensbachian) and an equivalent ash layer in the Lower Fernie phosphatic shale. Detrital zircon spectra from the Bathonian Gryphaea Bed silty limestone and the zircon ages from the mainly Oxfordian Green Beds glauconitic sandstone also are likely indicative of contemporaneous ash-falls. The presence of multiple volcanic ashes throughout the Jurassic system in the Western Canada Sedimentary Basin supports tectonostratigraphic models with relatively nearby western magmatic activity. The southeastern Omineca crystalline belt and Quesnellia terrane contain magmatic rocks with ages that could account for all of the Fernie ashes, and are closest to the depositional basin, but source terranes farther afield cannot be ruled out.

## **References:**

Canadian Geochronology Knowledgebase, 2013. Canadian Geochronology Knowledgebase: Geological Survey of Canada, <https://www.nrcan.gc.ca/earth-sciences/geography/atlas-canada/geochron/17012> (accessed February 2017).

Pană, D.I., Poulton, T.P. and Heaman, L.M. 2018. U-Pb zircon ages of volcanic ashes integrated with ammonite biostratigraphy, Fernie Formation (Jurassic), Western Canada, with implications for Cordilleran-Foreland basin connections and comments on the Jurassic time scale. *Bulletin of Canadian Petroleum Geology*, vol. 66.