



Department of Geology Seminar Series Presents

Geological Association of Canada
2019-2020 Howard Street Robinson Medalist

JoAnne Nelson

Emeritus Scientist
British Columbia Geological Survey

The great Triassic-Jurassic Cu-Au-Mo porphyries of the central Canadian Cordillera: Why there? Why then?

MONDAY, SEPTEMBER 23 - 11:30am

Science 411

Everyone is welcome to attend!



GEOLOGY
FACULTY OF SCIENCE



GEOLOGICAL
ASSOCIATION OF CANADA
ASSOCIATION
GÉOLOGIQUE DU CANADA

smu.ca



SAINT MARY'S
UNIVERSITY SINCE 1802

One University. One World. Yours.

2019-2020 GAC Howard Street Robinson Medalist, JoAnne Nelson, Emeritus Scientist, British Columbia Geological Survey



Title: *“The great Triassic-Jurassic Cu-Au-Mo porphyries of the central Canadian Cordillera: Why there? Why then?”*

Abstract

The Canadian Cordillera has developed as an orogenic belt over 700 million years, beginning with a Neoproterozoic-Early Cambrian intracontinental rift that created the western margin of Laurentia. Its history as an active tectonic region continues today, though interactions with the Pacific Plate: earthquakes along the Queen Charlotte and Denali transform faults, and collision of the Yakutat block that is lofting the St. Elias Mountains and creating a zone of tectonic instability that extends over 1000 kilometres inland to the eastern front of the MacKenzie Mountains. Construction of the Cordilleran orogen was preceded by evolution and interaction of offshore and exotic terranes, which eventually accreted to the western Laurentian (North American) cratonal margin, primarily in Middle Jurassic to Cretaceous time. During a relatively short time interval prior to accretion (220-178 Ma), world-class belts of porphyry and related gold deposits – famous names like Highland Valley, Mt. Milligan, Afton, Copper Mountain, Red Chris and KSM-Brucejack – emerged in two of the offshore terranes, Quesnellia and Stikinia. This presentation attempts to explain how, in the larger context of Cordilleran evolution, Quesnellia and Stikinia became perfect porphyry hosts, and why Cu-Au-Mo porphyries flourished in the two separate terranes during the same brief period of time. To grasp the long-term processes that primed and prepared the lithosphere of these two multistage island arc terranes, and the profound tectono-magmatic events that triggered porphyry emplacement in them, is to understand that their full metallogenetic potential has yet to be realized. Major deposit discoveries in the last decade (Red Chris, KSM-Brucejack, Tatogga, Deep Afton) illustrate this optimistic view: that like the history of the Cordillera itself, the saga of exploration within it is set to continue into unknown future time.

Biography

JoAnne Nelson is an Emeritus Scientist with the British Columbia Geological Survey (BCGS), after a 31 year career as a regional mapping geologist specializing in the tectonics, structural geology and metallogeny of the northern Cordillera. She is the senior author on two articles synthesising Cordilleran tectonics and metallogeny (SEG Special Volume 17, 2013; GAC-MDD Special Publication 5, 2006); co-edited GAC Special Volume 45 with Maurice Colpron on Cordilleran pericratonic terranes; and co-authored *The Geology of British Columbia* with Sydney and Richard Cannings (Greystone Books, 2011).

JoAnne's accomplishments were formally recognized in 2013 when she was listed in the top *100 Global Inspirational Women in Mining* by the United Kingdom's Standard Bank. In 2015, she was presented with the *Gold Pick Award* by the Kamloops Exploration Group (KEG) in recognition of "outstanding services and contributions to the minerals industry". AME awarded her a Special Tribute for scientific leadership in 2016, and in 2017 she received the Canadian Provincial and Territorial Geologists' medal.

Howard Street Robinson Medal

The Howard Street Robinson Medal recognizes a respected and well-spoken geoscientist who will further the scientific study of Precambrian Geology and/or Metal Mining through a presentation of a distinguished lecture across Canada. The medal is named in honour of Howard Street Robinson, a founding member of the GAC whose bequest to GAC in 1977 of approximately \$100,000 makes the lecture tour possible. The bequest was "for the furtherance of scientific study of Precambrian Geology and Metal Mining". Thus the GAC's Mineral Deposits Division awards the medal in odd years, and the Precambrian Division awards it in even years. The lecturer is nominated and chosen by the Howard Street Robinson Medal Committee.