Department of Geology Seminar Series Presents

2019-2020 Science Atlantic-AGS Speaker Tour

Dr. John Jamieson

Canada Research Chair in Marine Geology
Department of Earth Sciences
Memorial University

Ore-forming processes on the seafloor – understanding the difference between black smoker vent fields and the formation of metal-rich massive sulfide mineral deposits

MONDAY, NOVEMBER 18 · 11:30am

Science 411

Everyone is welcome to attend!

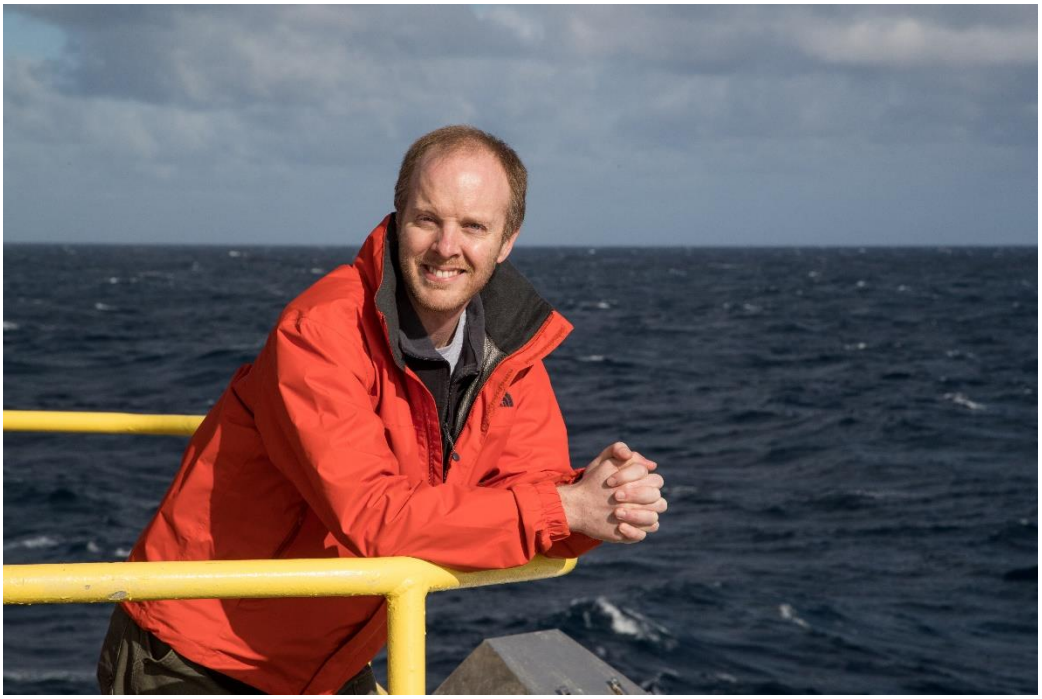
SAINT MARY'S UNIVERSITY SINCE 1802 | GEOLOGY
FACULTY OF SCIENCE

Dr. John W. Jamieson, Canada Research Chair in Marine Geology, Department of Earth Sciences, Memorial University of Newfoundland

Title: *Ore-forming processes on the seafloor – understanding the difference between black smoker vent fields and the formation of metal-rich massive sulfide mineral deposits*

Abstract

Since the initial discovery of black smokers on the East Pacific Rise in 1979 a significant amount of research and exploration efforts has focused on finding and studying active seafloor hydrothermal systems along submarine tectonic boundaries. The evolution of exploration methodologies and development of new marine survey technology has advanced to the point where the discovery of new vent fields is becoming routine. This increasing rate of discovery coincides with increasing interest to mine the metal-rich seafloor massive sulfide (SMS) deposits that can form at hydrothermal vents. To properly evaluate the resource potential and environmental consequences of mining SMS deposits, it is important to recognize that not all seafloor hydrothermal systems are necessarily ore forming systems that are metal-rich and have generated, or are generating, SMS deposits of large-enough size to be economically-viable targets for mining. Despite significant promotion and debate surrounding seafloor mining, exploration and sampling efforts indicate that very few of the ~400 seafloor massive sulfide deposits discovered to date are economically feasible targets. In most cases, there simply is not enough information at the deposit scale for a proper evaluation of either grade or tonnage. Where grades and tonnages for SMS deposits have been reported, they are often based on assumptions regarding the composition of the subseafloor material that makes up the bulk of these deposits. In this talk I will present examples of the striking variability in composition of hydrothermal deposits along the Mid-Atlantic Ridge and discuss why not all deposits that accumulate at high-temperature hydrothermal vent fields are necessarily ore-forming seafloor massive sulfide deposits.



Biography

Dr. John Jamieson is the Canada Research Chair in Marine Geology at Memorial University of Newfoundland where he has been since 2016. He did a B.Sc. at the University of Alberta, and MSc at the University of Maryland, and his PhD at the University of Ottawa where he worked with Dr. Mark Hannington. Between his B.Sc. and M.Sc., and then after M.Sc. he worked for two years in the Arctic doing gold exploration with Cumberland Resources. He spent 2 years at the Alberta Geological Survey, where he ran their metallic minerals program, and did a 2-year post-doc at GEOMAR at the Helmholtz Center for Ocean Research, in Kiel, Germany. His current research focuses on seafloor hydrothermal systems, ocean exploration, and marine mineral resources. He has participated in 14 research cruises, and to date has spent over 400 days at sea.