# **Geochemical Exploration Models for Porphyry Deposits in British Columbia** Fred Blaine\* and Craig Hart\*

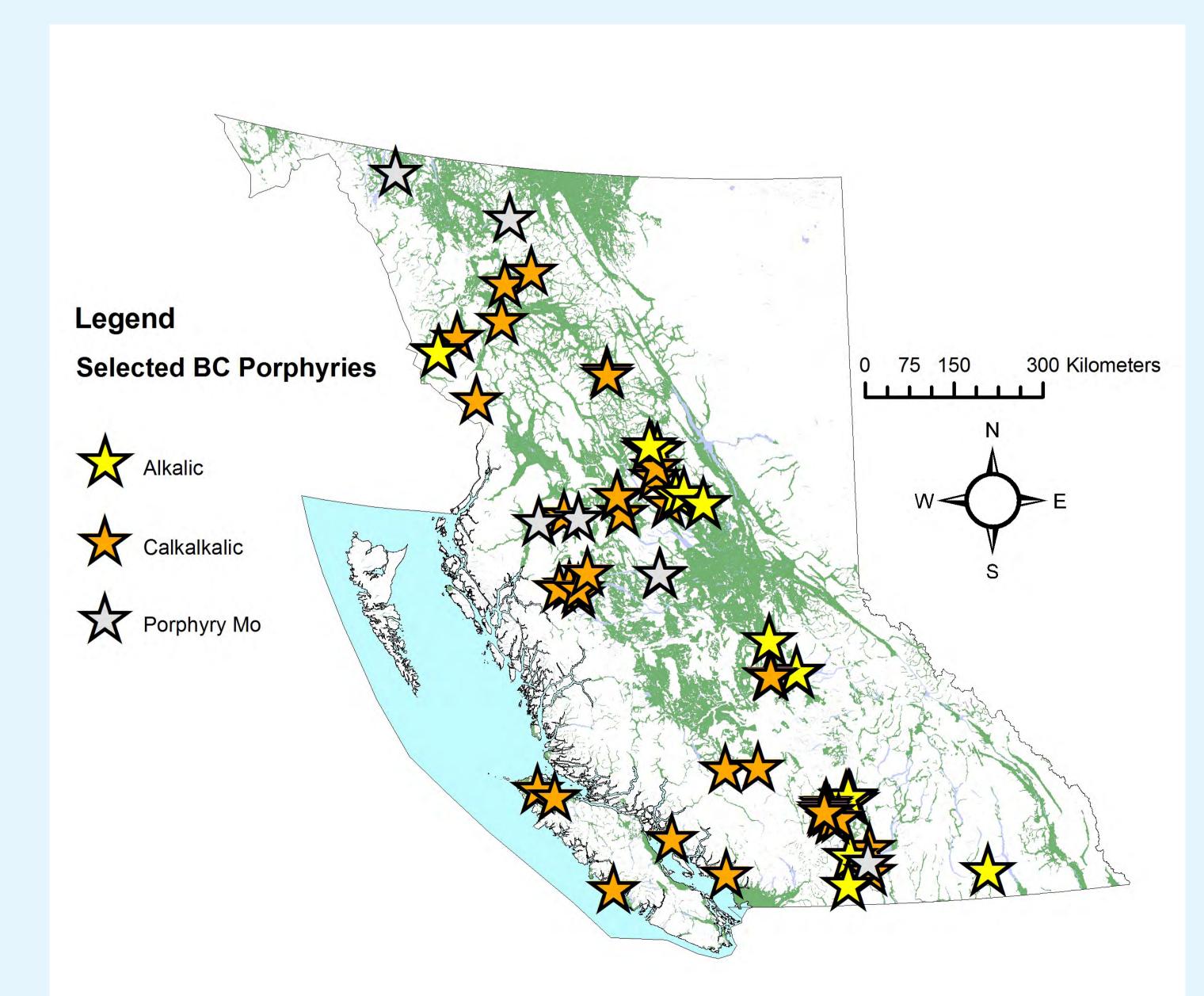
\*Mineral Deposit Research Unit (MDRU), University of British Columbia

## Introduction

Research in exploration geochemistry, and the controls on the surficial geochemical expressions of ore deposts, in North America has lagged behind that in other areas of the world (i.e. Australia). This is due in part to the success of exploration using traditional geochemical methods and interpretations. However, as targets are getting scarcer and exploration is moving into areas of thicker and more complex cover, more advanced techniques and interpretations are required; including increased consideration of the surficial environment in which the exploration is conducted.

The widely-varied geomorphological, topographic and climatic environments present in BC; all of which can exert significant control on the surficial expression of ore deposits; present a challenge when interpreting geochemical data. Geochemical exploration models representing "typical" geochemical expressions, in different environments and media, by various analytical techniques, can provide much needed information when planning and interpreting geochemical surveys.

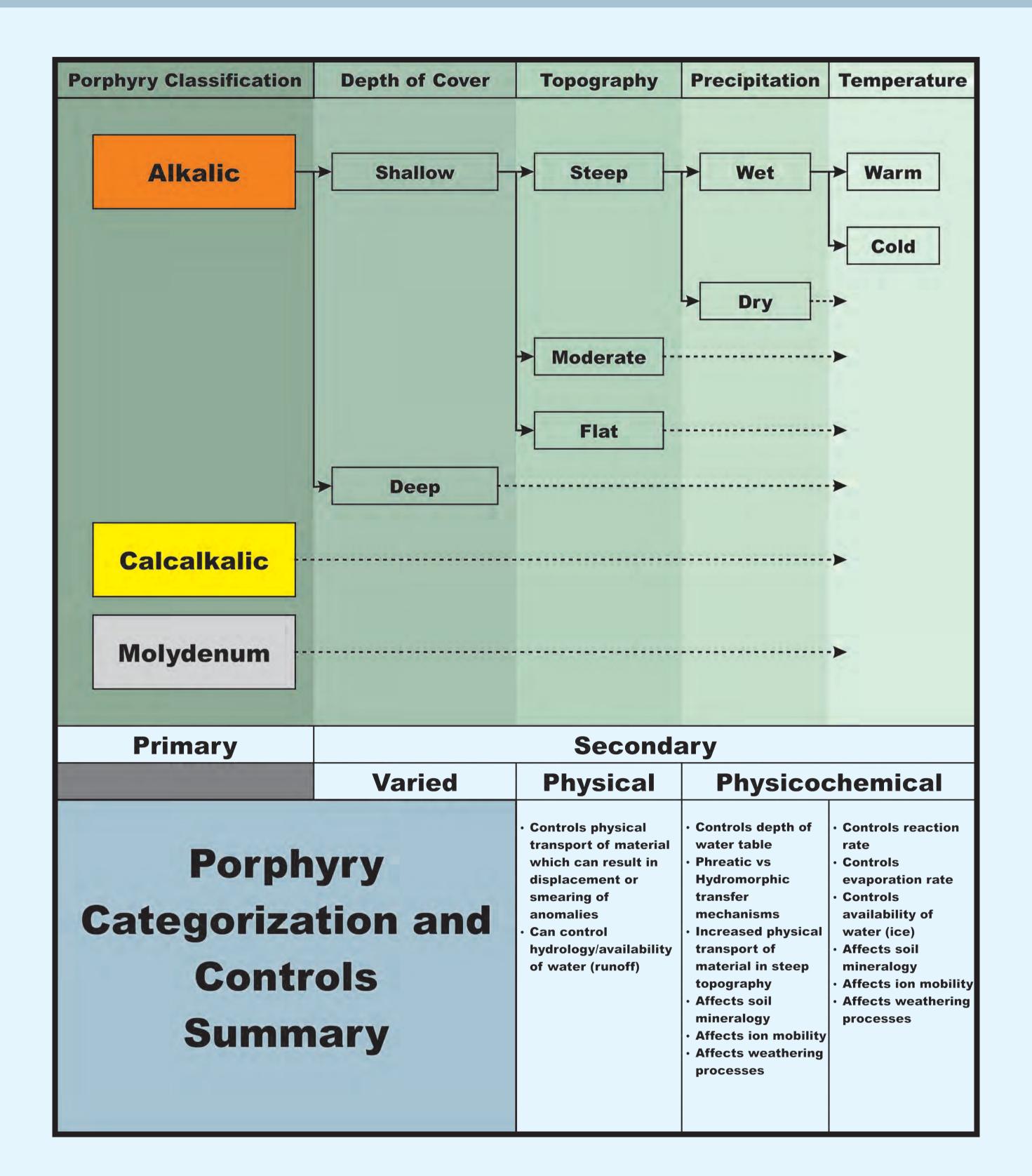
It is the purpose of this study to generate empirically-derived geochemical exploration models for porphyry deposits in BC. This will be achieved through compilation and interpretation of a BC-wide, porphyry geochemistry database based on a number of porphyries. These models will be based on classification of the deposits into categories based on porphyry type, cover (depth and type), topographic and climatic conditions.



Interpretation is currently at the individual deposit scale and is progressing tow In order to achieve the desired results, geochemical data is collected from multiple integration of the deposits as the categories are sufficiently populated. sources including:

- Data provided by industry

This data combined with geological, geophysical, topographic, surficial media and climatic data provides a comprehensive database covering many different porphyry types and exploration environments.



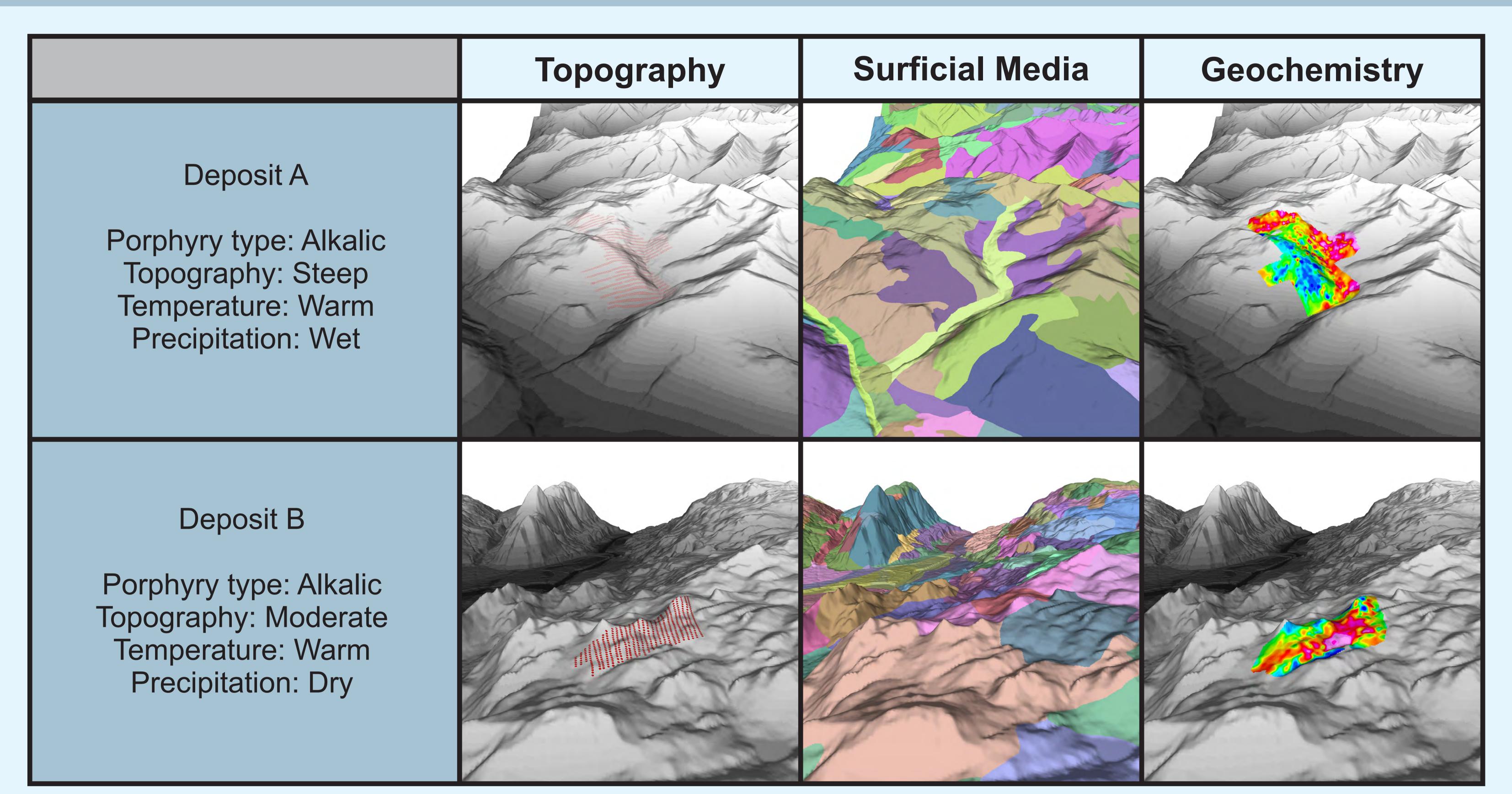
## **Porphyry Selection and Classification**

Porphyries (developed prospect through producer), are selected based primarily on the availability of data and are not filtered for size or potential. It is necessary to include an entire range, from barren to highly mineralized, over multiple scales, in order to develop effective models. Size and potential are not ignored and are addressed in discussion of the models. The general categorization scheme is outlined in the above table. Overlying material type will be addressed in the interpretation, although is not included in the categorization scheme due to its complexity.

## **Data Sources**

- ARIS reports
- Government studies (BCGS, GSC)
- GeoscienceBC reports





#### **Progress**

Forty porphyries have been classified and geochemical data for these deposits have b obtained from ARIS reports through a combination of manual entry and OCR. Dat being standardized and entered into a master database which includes all availa regional and target-study government and GeoscienceBC geochemical data. database will allow querying based on the categorization scheme as well as a numbe spatial and geochemical parameters. This will allow data to be assessed on mult levels of categorization from individual deposits, up to the primary classification ba on porphyry type.

Comments and suggestions of a scientific nature or on the project in general are welcomed. As well, if you have geochemical data that you would like to make available for use in this project and would like to discuss its inclusion, please contact me.

> Fred Blaine, Ph.D., Post Doctoral Fellow Mineral Deposit Research Unit, University of British Columbia 6339 Stores Road, Vancouver, BC, Canada V6T 1Z4 fblaine@eos.ubc.ca, 604-827-3223, www.mdru.ubc.ca

#### **Final Products**

been ata is ilable	The purpose of this study is to distill, and make available in a accessible format, the wealth of geochemical data available in BC for porphyry deposits. This data will be presented in the following forms:	
This		
per of	$\bigcirc$	A comprehensive BC porphyry geochemical database
ltiple based	٢	A series of enhanced, porphyry type- and environment-specific geochemical exploration models
	$\bigcirc$	Assessment of sampling and analytical procedures in specific environments
ward	$\bigcirc$	A series of workshops to transfer knowledge to industry