

Summer Research Project

Job Information

Title of Research Project: **Research support in geomorphometry (geomatics)**

Proposed Start Date: **May 1, 2023**

Name and Title of Supervisor: **Prof. John Lindsay**

Department: **Geography, Environment, & Geomatics**

Type of position: **URA** **ISURA** **USRA** **USRA (non-quota)**

Brief Outline of Research Project:

Geomorphometry (not to be confused with geomorphology) is the discipline concerned with the representation and quantitative analysis of Earth's surface topography. Geomorphometry is a sub-discipline of geomatics, drawing upon the methods and theories of geographical information systems (GIS), remote sensing, and spatial analysis. The discipline focuses on extracting information from digital elevation models (DEMs), often in the form of topographic indices known as land-surface parameters (LSPs), to better understand and model landscape processes. Topography affects the flow paths taken by runoff and the distribution of near-surface water and sediments. It also influences climatic properties, such as temperature, solar radiation, and exposure to wind. Each of these environmental conditions affects soil development, the spatial patterns of plants and animals, and the distribution of sediment and nutrients. Therefore, topography is a partial control on many phenomena of interest in environmental modelling applications. Over the past decades, improved topographic mapping technologies and analysis techniques have underpinned significant advances in soils and habitat mapping, flood forecasting and hydrological modelling, sediment modelling, slope stability analysis, geological resources inventorying, and numerous other applications. This summer research position will focus on the evaluation and application of novel multi-scale LSPs recently developed within the Geomorphometry & Hydrogeomatics Research Group (GHRG).

Job description (task/responsibilities, relevant scheduling details, and required and/or preferred qualifications):

This position will provide research support for ongoing projects in the Geomorphometry and Hydrogeomatics Research Group (GHRG). In particular, the successful candidate will be involved with the manipulation and analysis of topographic data sets (e.g., lidar), particularly with respect to multi-scale interrogation of landscapes. These activities will involve extensive use of geographical information systems (GIS) (e.g. QGIS) and other geospatial analysis software (e.g. Whitebox) and will require the student to be proficient in Python programming. The successful candidate may also be directly to other activities related to the day-to-day operation of the research group. There is a preference for students enrolled in a Geography undergraduate program or related field.