## John Lindsay's Biography

Prof. John Lindsay carried out his graduate studies at the University of Western Ontario, completing his PhD in 2005. John was *Lecturer of Geoinformatics* at the University of Manchester from 2004 until moving back to Canada to join the University of Guelph's Department of Geography in 2008. His research explores applications of geomorphometry to spatial hydrology and geomorphology. He is particularly interested in applications involving laser scanning (LiDAR) for topographic modelling and the use of digital elevation models (DEMs) to model surface drainage patterns. Headwater channel systems, gullies, and ephemeral streams are also important strands of his research program. The development and testing of novel techniques for spatial analysis is central to Prof. Lindsay's research and as such he develops the open-source GIS software *Whitebox Geospatial Analysis Tools* to serve as a platform for these research contributions. Whitebox GAT has been used for environmental research and education in more than 150 countries worldwide.

## Issues in DEM-based flow-path modelling

Digital elevation models (DEMs) are a primary data input for many applications in spatial hydrology and geomorphology. DEMs are commonly used to delineate watersheds, to map landforms and soils, to analyze stream networks, and to model variable source areas, surface runoff and flooding, erosion, and contaminant migration. The past decades have been marked by significant improvements in the quality, spatial resolution, and availability of DEM data sources. These new-generation DEMs have spurred a period of innovation in both the techniques used to analyze DEMs and in their applications. However, all DEMs used for spatial hydrological applications must be processed to remove certain classes of error and data inconsistencies prior to their use. This necessary pre-processing step in the spatial hydrology workflow is known as the creation of a *hydrologically corrected DEM*. Although frequently overlooked by practitioners, the techniques used to create hydrologically corrected DEMs have large implications for applications of these data. This research talk explores some of the main issues involved in the pre-processing of DEMs used for spatial hydrology, including methods used for removing artifact topographic depressions and for enforcing consistency between DEM-extracted stream networks and mapped hydrography data.