

## **Abstract**

There were around 65,000 search and rescue (SAR) incidents from 1992 to 2009 throughout national parks in the United States. Of those incidents, around 2,500 were fatal. Studies surrounding SAR incident data typically revolve around the subject rescue and recovery process. The study of lost person behavior and psychology can also affect this field of work in a way that is beneficial to the lost subject. Search and rescue incident commanders (IC) must exhaust all possible indications of where the subject may be and which direction they may have traveled. The objective of this study was to apply least cost path analysis to search and rescue data in Yosemite National Park. For this study to be successful, the cost paths will indicate possible evidence of deviation from designated park trails. The least cost path analysis required an incident planning point (IPP) and a subject found or recovery point for each case investigated. An overland travel cost surface was constructed using impedance tables from Integrated Geospatial Tools for Search and Rescue (IGT4SAR). One hundred seventeen SAR cases were subject to least cost path analysis in this study. Resulting paths were traced manually from beginning to end to find points of divergence from trails or roads. Thirty-six paths contained likely divergence points. Thirty-one were from trails and five were from roads. This confirmed the least cost path analysis and trail divergence studies were successful. There were also clusters of divergence points in some park locations, suggesting possible problematic areas. While it is not implied that the paths are exactly those chosen by lost individuals, the methodology can be reproduced with different data to assist with park trail construction or maintenance.