Introduction

Winter sports such as skiing and snowboarding are becoming more popular in the province of British Columbia and the industry is growing as a result. There are a lot of factors to consider during the planning process of finding suitable areas for the development of a new ski resort. Some of the criteria that was provided by the client included topography, climate, precipitation, land ownership and tenure, accessibility by different modes of transport, environmental considerations, surrounding communities, and economy.

The goal of this project was to determine ski resort development suitability based on the following criteria: elevation, slope, aspect, snow depth, provincial and national parks, protected areas, alpine ski resorts, land ownership and tenure, and road access.



Methodology

Three models for elevation, slope, and aspect were created using a 20-meter resolution Digital Elevation Model (DEM) and the Fuzzy Membership tool. The Fuzzy Membership tool reclassified and set the values of each layer between o and 1 in order to combine them using the Weighted Sum tool. Data ranging from 1981 to present regarding average snow depth in winter (Dec-Feb) and spring (Mar-May) was retrieved from a combination of 53 climate and snow stations. The Inverse Distance Weighting (IDW) interpolation tool was used to create a raster from the station points. The weighted sum tool was then used to visualize ski suitability based on elevation, slope, aspect, and snow depth.

A raster was created from polygon feature classes to represent areas that are unavailable such as provincial and national parks, protected areas, alpine ski resorts, and land subject to ownership and tenure. The Raster Calculator tool was then used to multiply ski suitability by the latter in addition to elevation below 1300 meters and slopes below 8% and above 80% to show ski resort development suitability. The Euclidean Distance and inverse Fuzzy Membership tools were used to narrow down ski resort development suitability by calculating proximity to highways and forest service roads (FSR).

Limitations and Assumptions

- Time constraints and time-consuming processes
- Variation in type of data and range of years available from climate and snow stations
- Mistakes in the data from stations
- Inadequate number of stations to use interpolation tool for variable topography

Data Sources

- Canadian Climate Normals
- **River Forecast Centre**
- Geospatial Data Extraction
- BC Data Catalogue



Exploring Potential Ski Resort Locations in British Columbia

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Ski Suitability based on Snow Depth **Prince George Prince George**





Results and Discussion

The amount of area that is suitable for the development of a new ski resort decreases as more factors are considered. The final map shows that potential ski resort locations based on elevation, slope, aspect, snow depth, provincial and national parks, protected areas, alpine ski resorts, land ownership and tenure, and road access are surrounding Revelstoke, Golden, and Valemount.

Of all the criteria that was analyzed in this project, elevation below 1300 meters, slopes below 8% and above 80%, and unavailable areas have the greatest influence on the amount of suitable areas that are available, followed by road access.

