

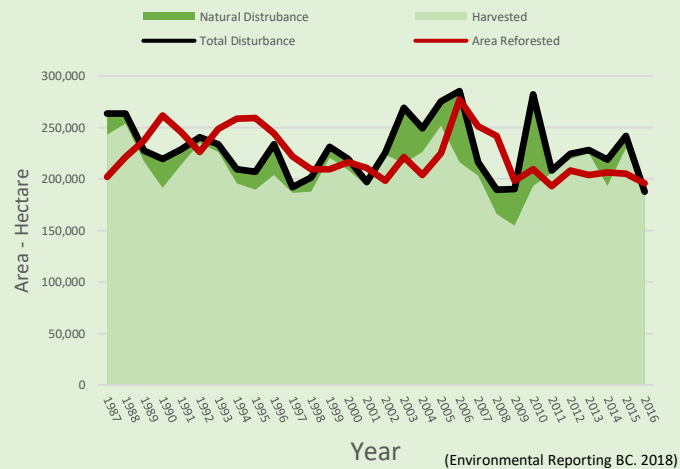
# Silviculture Activity Effects on Woodland Caribou Herds in the Omineca Region of British Columbia, Canada

Karolina Tchilingirova – GPHY 345

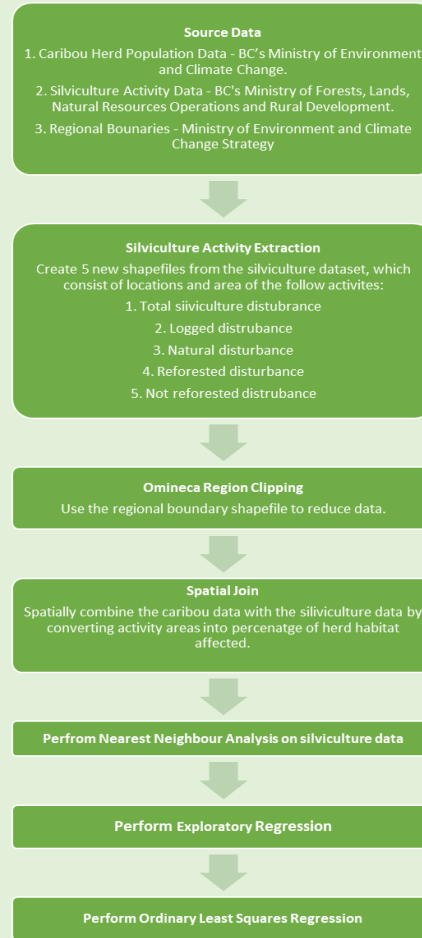
## Introduction

This investigation explores the relationship between silviculture activity and caribou herd populations in the Omineca Region of British Columbia, Canada. Silviculture activities of interest include forest disturbances caused by natural events, commercial logging and reforestation of those disturbances. Timber harvesting consist of over 90% forest disturbances in British Columbia and is an important aspect of the Canadian economy. Between 2017 and 2018, over 170,000 hectares of BC's forest were harvested for timber and over 180,000 hectares were involved in reforestation activities (Environmental Reporting BC, 2018). Many of these silviculture activities overlap with the habitat of the Woodland Caribou of British Columbia. This species of caribou is unique from other which are adapted to tundra type climates. Woodland caribou are instead forest dwellers and require large tracts of contiguous forest to maintain space from predators. The habitat deterioration, fragmentation and destruction of the Woodland Caribou has resulted in population number decreasing from 40,000 to 15,000 is the last 100 years (Natural Resources Canada, 2018).

Yearly BC Forest Disturbances and Reforestation by Area (1987 - 2016)



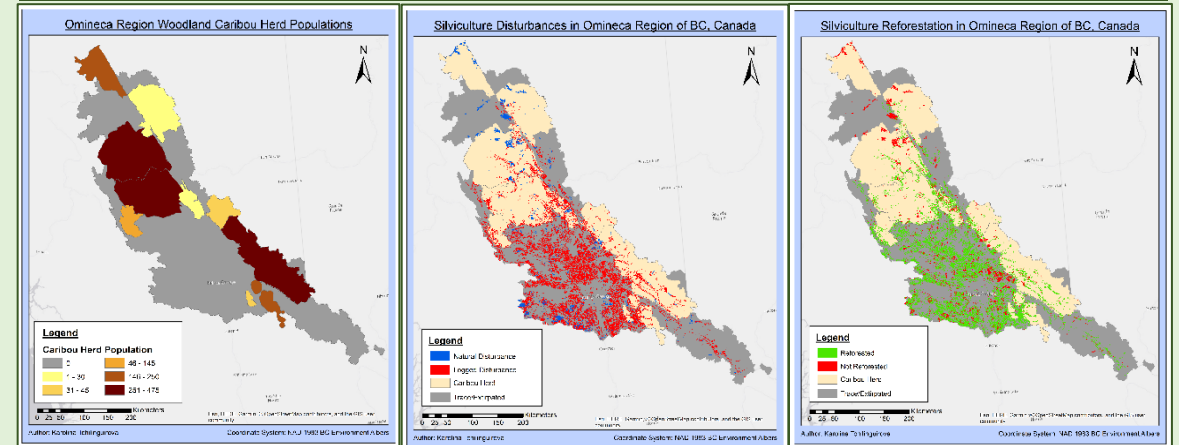
## Method



## Conclusion

Average Nearest Neighbor analysis conducted on the forest disturbance data found a high level of habitat fragmentation with a forest disturbance every 700 meters on average. An exploratory regression was conducted to identify the statistically significant independent variables. The returned variables were each used in a univariate ordinary least square regression. The variables included total area disturbed, area disturbed by logging and reforested areas modeled against the dependent variable of caribou populations. The regression result demonstrated a strong negative correlation between silviculture practices and caribou herd populations, logging disturbances have a larger effect on population than natural disturbances, and reforested areas do not improve caribou herd populations.

## Data



## Results

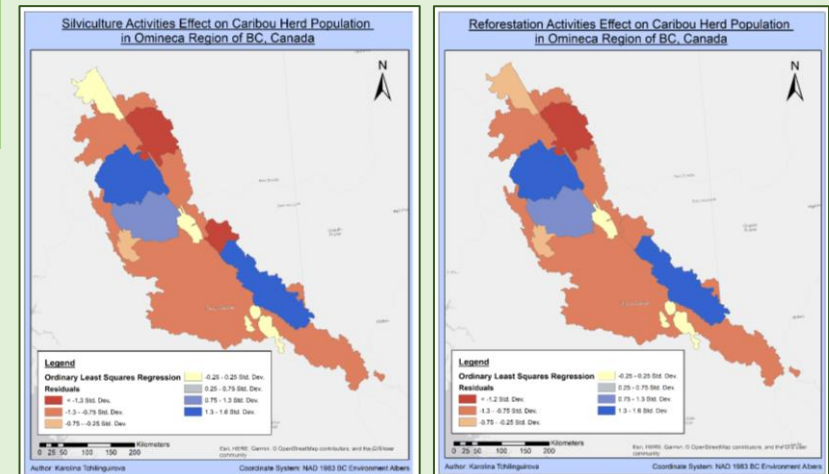
### Average Nearest Neighbor Analysis:

The following table shows the average mean distance between silviculture activities within the Woodland Caribou habitat. These results present the level of habitat fragmentation in the Omineca Region.

Silviculture Activity	Average Mean Distance (Meters)
All Activities	669.0
Logged	970.0
Natural Disturbance	1494.6
Planted	713.2
Not Planted	1303.2

### Ordinary Least Squares Regression Analysis:

Each regression model produced a negative relationship with caribou herd population. The regression residual maps highlight herds that deviate away from the regression model. Polygons which are of high contrast are highly deviating with red deviating negatively and blue deviating positively. Therefore, these maps predict the fate of the caribou herds in this region. The red polygons represent herds which are predicted to have their population decrease at a rate faster than the regression estimates. Whereas, blue polygons represent herds which are predicted to have their population decrease at lower rate than the estimate value as given by the regression model. However, despite the positive deviation from the regression, all caribou herd population are estimated to decrease.



## References

- Ecosystems. *Caribou Herd Locations for BC*. British Columbia: Ministry of Environment and Climate Change Strategy, February 14<sup>th</sup>, 2018.
- Environmental Reporting BC. 2018. Trends in Silviculture in B.C. (1987-2016). Ministry of Forests, Lands, Natural Resource Operations and Rural Development, British Columbia, Canada.
- Environmental Reporting BC. 2018. Trends in Timber Harvest in B.C. Ministry of Forests, Lands, Natural Resource Operations and Rural Development, British Columbia, Canada.
- Learn About Caribou in British Columbia. Natural Resources Canada. (2018, October 29<sup>th</sup>). Woodland caribou. Retrieve from <https://www2.gov.bc.ca/gov/content/environment/plants/animals/ecosystems/wildlife/wildlifeconservation/caribou/learn-about-caribou>
- Ministry of Forests, Lands, Natural Resource Operations and Rural Development (2018). *Provincial Caribou Recover Program; 2017/2018 Annual Report*. Victoria, BC.
- Resource Practices. *RESULTS – Opening swv*. British Columbia: Ministry of Forests, Lands, Natural Resource Operations and Rural Development, November 3<sup>rd</sup>, 2017.