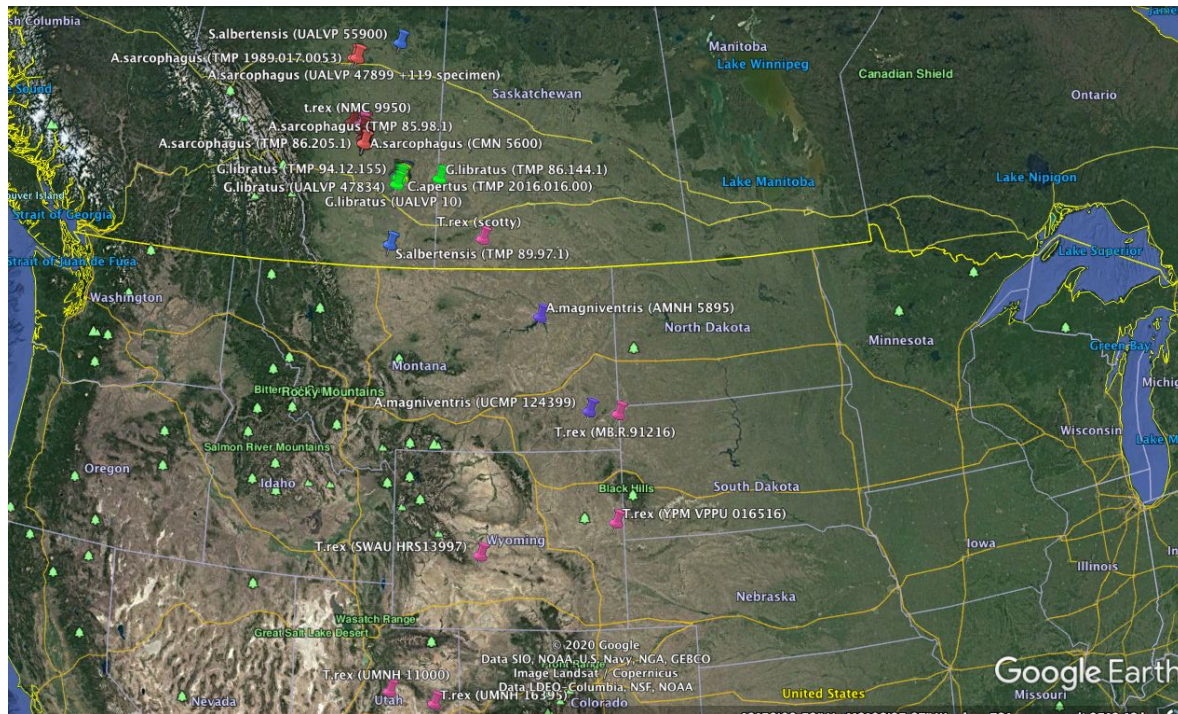


# Literature Review

## Geographic ranges of the species living in western North America during the Late Cretaceous Period

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*Pink pins represent Tyrannosaurus rex, purple pins represent Ankylosaurus magniventris, green pins represent Gorgosaurus libratus, blue pins represent Styracosaurus albertensis, red pins represent Albertosaurus sarcophagus and the yellow pins represent Centrosaurus apertus. Plotted by my lab partner S. Roper*

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## Introduction

Multiple species of dinosaurs have been found all over western Canada and the uppermost portion of the United States. The species that were looked at in this study are *Ankylosaurus magniventris*, *Centrosaurus apertus*, *Pachyrhinosaurus lakustai*, *Styracosaurus albertensis*, *Albertosaurus sarcophagus*, *Gorgosaurus libratus*, and *Tyrannosaurus rex*. Information on the ranges of these specimens is not readily available. This type of research is important for future fossil discoveries, because it allows us to look at the distribution of dinosaur species across western North America. The study focused on British Columbia, Alberta, Saskatchewan, Yukon and the Northwest Territories in Canada. As well as Washington, Oregon, Montana, Idaho, Wyoming, North and South Dakota, in the United States. We included the specimen type and specimen number in our data sheets. Ideally the locations of the specimens looked at would be plotted on a detailed map, unfortunately time restrictions have prohibited that.

## Purpose

This study is extremely important for a number of reasons. By knowing the range of a particular species researchers can then look around for gaps in localities. This can lead to future discoveries of more specimens in these areas. It will give palaeontologists a place to look, as well as an idea of the areas certain species inhabited. This can also give researchers a better insight into the behaviours of the various animals such as their migration patterns, whether they travelled in herds or not, and what species competed with each other. Although there is no way to know for certain how these animals interacted we can predict it by comparing specimen locations and types.

## Review

### *Centrosaurus Apertus*

Information for this species was collected from the papers “Taphonomy of a Monodominant *Centrosaurus Apertus* (Dinosauria: Ceratopsia) Bonebed From the Oldman Formation of Southeast Alberta” by Kentaro Chiba, Michael J. Ryan, ect... and “Cretaceous

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Dinosaur Bone Contains Recent Organic Material and Provides an Environment Conducive to Microbial Communities” by Evan T. Sattia, Renxing Liang, ect. While analyzing this data it was found the *Centrosaurus Apertus* was most concentrated in Alberta, more specifically in the Dinosaur Provincial Park area.

### *Styracosaurus Albertensis*

The data on this species was collected from “A New Genus and Species of Ceratopsian from the Belly River Formation” by Lawrence M. Lambe and “Morphological Variation and Asymmetrical Development in the *Styracosaurus Albertensis*” by Robert B. Holmes. After looking through the data from these papers it was found that the *Styracosaurus Albertensis* was most common in the Dinosaur Provincial Park area, in Alberta. Although there have been some specimens found as far as Musidora, Alberta and in the Belly River Formation. This leads to the prediction that this species can be found anywhere in between these locations as it must have travelled over the land, if the geographic conditions allowed for preservation at the time.

This data also shows that the *Centrosaurus Apertus* and *Styracosaurus Albertensis* may have had contact with each other because their fossils were commonly found at the same dig site. The idea of this may become more relevant if more sites were analyzed for these species.

### *Gorgosaurus Libratus*

A few of the articles reviewed to collect the information on these species were “On a New Genus and Species of Carnivorous Dinosaur from the Belly River Formation of Alberta with a Description of the Skull of *Stephanosaurus Marginatus* from the Same Horizon”, by Lawrence M. Lambe, “Reassessment of a Juvenile *Daspletosaurus* from the Late Cretaceous of Alberta, Canada with Implications for the Identification of Immature *Tyrannosaurids*.” by Jared T. Voris, etc. This species was also found to be highly concentrated in Dinosaur Provincial Park Formation in Alberta. A few specimens have been found as far as the South Saskatchewan river, near the Alberta border.

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This species would most likely of had contact with the other specimens found in the dinosaur park area

### *Albertosaurus sarcophagus*

Information on the *Albertosaurus sarcophagus* fossils found in western Canada was collected from the papers, “Cranial Anatomy of Tyrannosaurid Dinosaurs from the Late Cretaceous of Alberta, Canada” by Phillip J. Currie, “A Taxonomic Assessment of the Type Series of *Albertosaurus sarcophagus* and the Identity of Tyrannosauridae (Dinosauria: Coelurosauria) in the *Albertosaurus* Bonebed from the Horseshoe Canyon Formation (Campanian- Maastrichian, Late Cretaceous)” by Thomas D. Carr, etc. After analyzing the data from these papers it was found that this species was most populated in Horseshoe Canyon Formation located in Alberta. They can also be found further south and with further research their appearance may become more common.

### *Tyrannosaurus rex*

Although there are not many *Tyrannosaurus rex* fossils in Alberta, many papers are written on the few and cross referenced. Our papers included, “The Paleoenvironment of *Tyrannosaurus rex* from Southwestern Saskatchewan, Canada”, by Elisabeth E. McIver, “New Examples of *Tyrannosaurus rex* from the Lance Formation of Wyoming, United States” by Sebastian G. Dalman, etc. With these papers we compiled the data and found that the *Tyrannosaurus rex* was greatly dispersed throughout Alberta, Saskatchewan, Montana, Wyoming, and Utah. This suggests they were unlikely to travel in packs and hunted alone. Most commonly the specimens were found in Hell Creek Formation and Lance Formation, Montana

### *Ankylosaurus magniventris*

To compile information on discoveries of *Ankylosaurus magniventris* fossil's articles were reviewed. These included, “Redescription of *Ankylosaurus magniventris* Brown 1908 (Ankylosauridae) from the Upper Cretaceous of the Western Interior of North America”, and “Baby Dinosaurs from the Late Cretaceous Lance and Hell Creek Formations and a Description of a New Species of Theropod” both by Kenneth Carpenter. The data from these papers showed that the two specimens were found in Eastern Montana, USA. They were found quite far from each other but with further research we would most likely have found specimens in between the two.

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The *Tyrannosaurus Rex* and *Ankylosaurus Magniventris* were likely to have had contact in the Hell Creek area of Montana.

## Key themes

By knowing the locations and potential locations of fossils we can do the most to protect and preserve fossils. Alberta is one of the strictest places for fossil conservation. Fossil ownership here must be recorded as well as the dig site. If a specimen is to be passed on, the new owner must also be recorded. These records are important in Fossil conservation and protection.

## Procedures

During this research Scopus and The Web of Science were used to find articles regarding the dig sites of our species of interest. Once articles were collected they were scanned for the appropriate information such as Specimen Type, Formation, Collection Number, and Coordinates. In this study GPS coordinates were preferred. Other types of coordinates need to be converted to GPS.

## Conclusion

With the information collected and plotted it is easy to get an overview of where the species we looked at were located. Many specimens were found around the Dinosaur Park area which leads me to believe that this area was either most populated and life abundant. A second reasoning for this could be that the area is more looked at than its surroundings. It has been possible to map this data on Google Earth Pro for a general overview of the dispersion. As discussed above we can see which species most likely interacted on an almost daily basis. The data also shows that we may be able to find new specimens in between the high traffic areas, as the dinosaurs would have to have travelled across this land.

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