



# Manitoba Barley Yields Clustering

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# PROBLEM STATEMENT

Can we find  
clusters of  
similar RMs  
for Barley  
yields in  
Manitoba?

- Insurance and  
financing  
companies can  
set premiums
- Better risk  
management



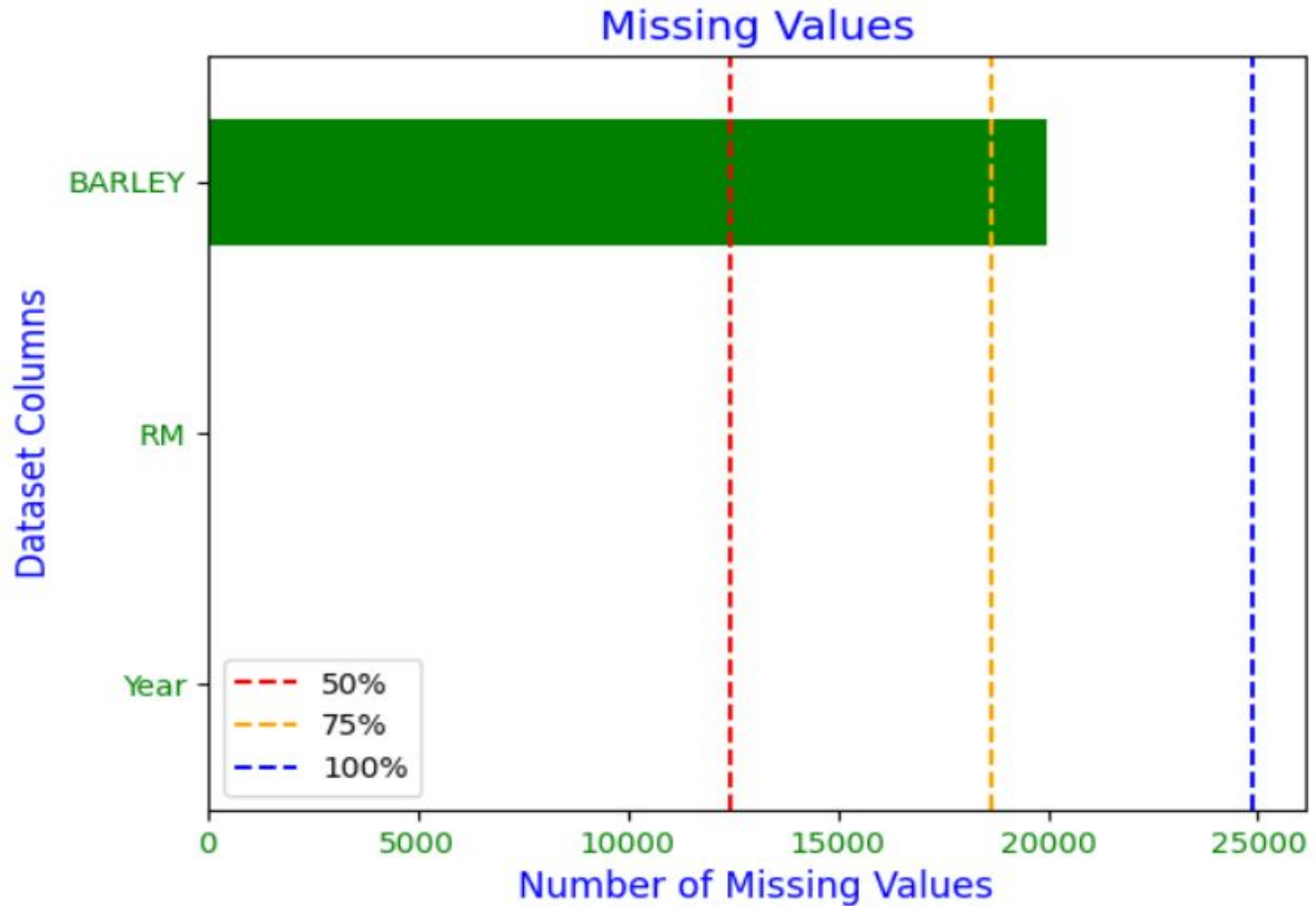


# DATA COLLECTION & PREPROCESSING

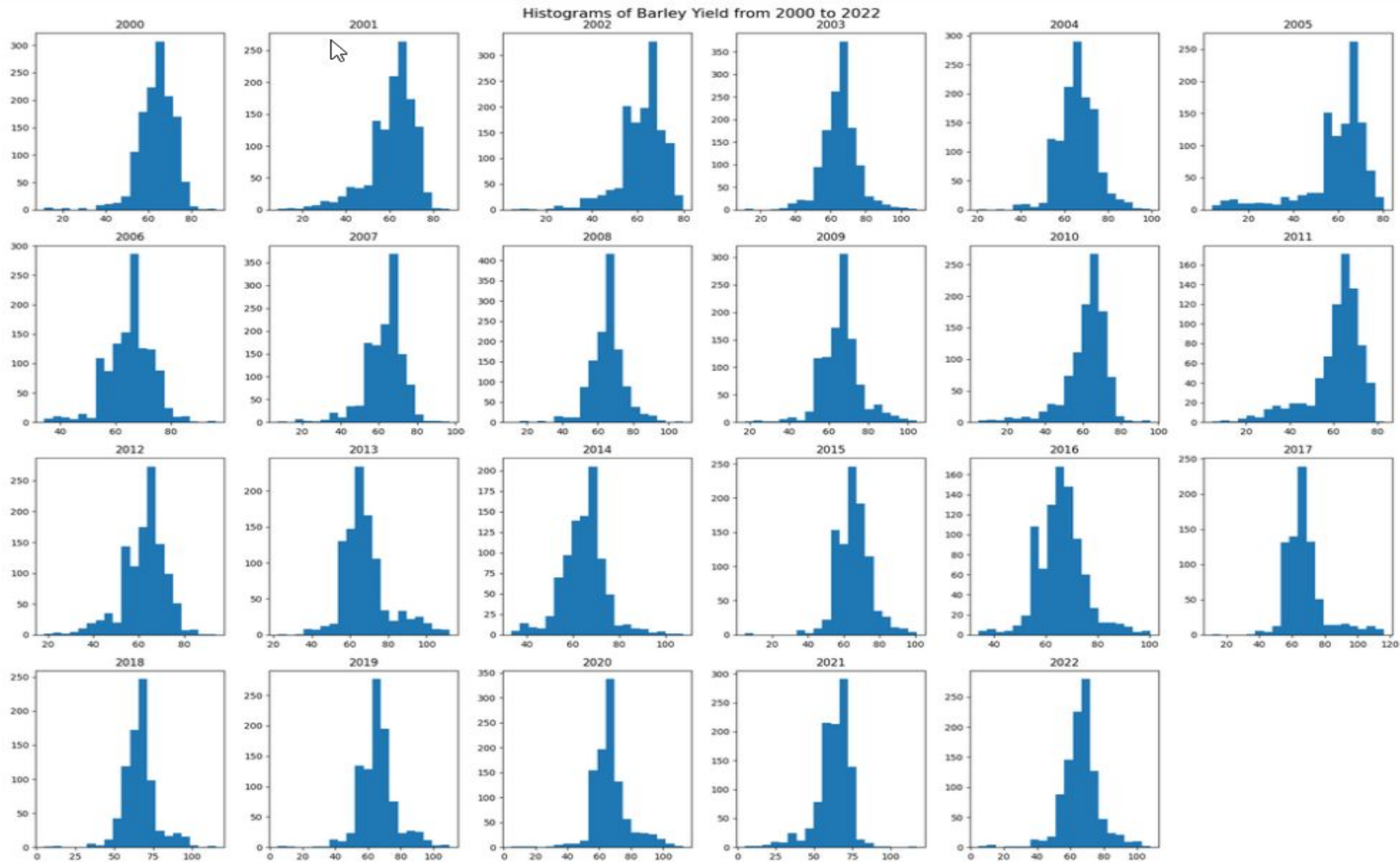
- Manitoba Crop Yields :  
[https://www.masc.mb.ca/masc.nsf/mmpp\\_browser\\_soil\\_types.html](https://www.masc.mb.ca/masc.nsf/mmpp_browser_soil_types.html)
- Geographical Boundaries of Manitoba Rural Municipalities:  
<https://geoportal.gov.mb.ca/datasets/8b64285c3bf6445a8d0d8ea4a1c43849/explore?location=53.584348%2C-97.779011%2C6.81>
- Crop Yields from 2000-2022
- 11 crops : Alfalfa, Argentine Canola, Barley, Canary Seed, Durum Wheat, Faba Beans, Fields Peas, Flax, Lentils, Oats, Winter Wheat.
- Pounds : Canary seed, Faba Bean, Lentils
- Barley yield is in Bushels.
- Dropped unnecessary columns



# EXPLORATORY DATA ANALYSIS



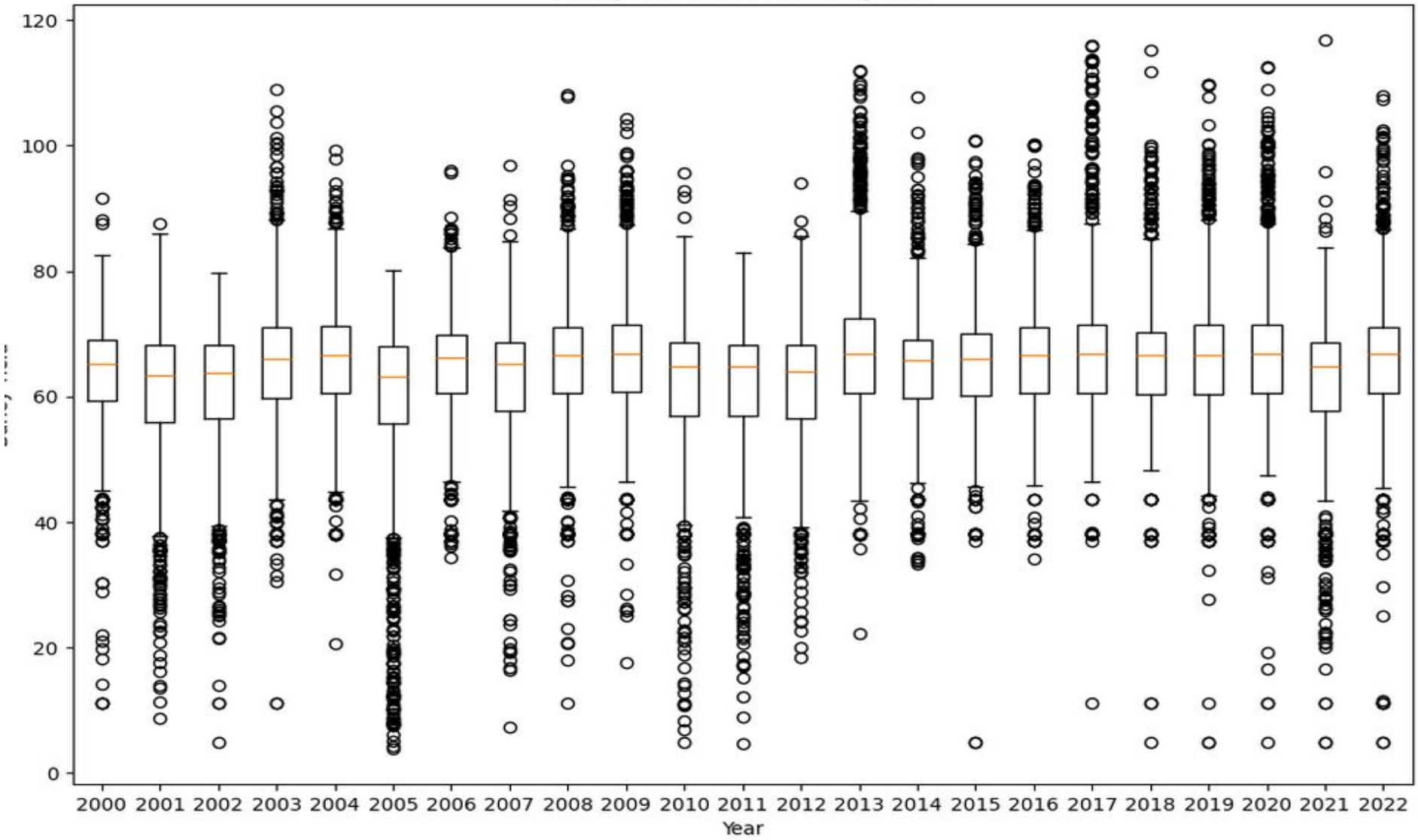
# EXPLORATORY DATA ANALYSIS



# EXPLORATORY DATA ANALYSIS

Box Plots of Barley Yield from 2000 to 2022

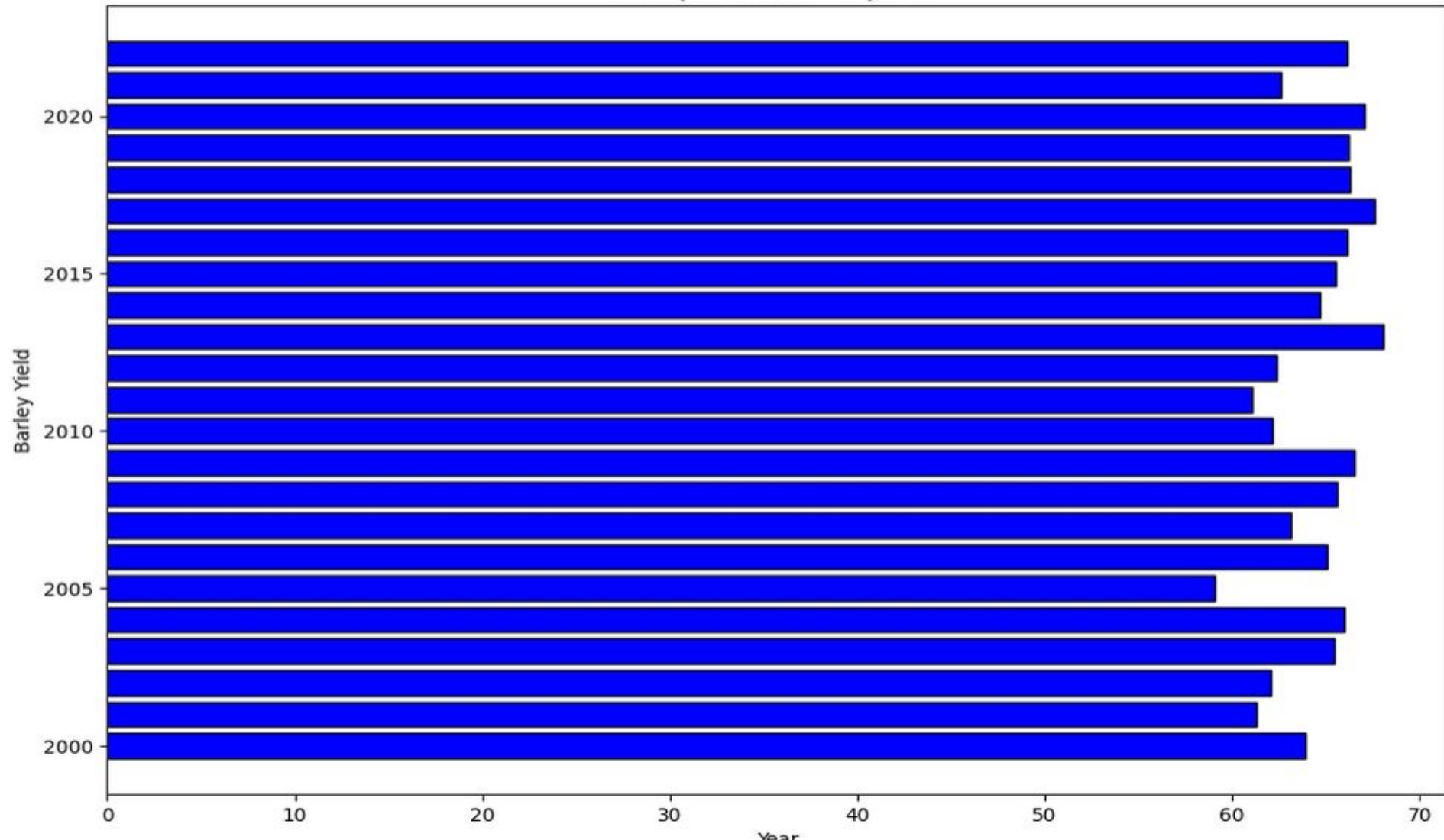
Barley Yield Distribution by Year



# EXPLORATORY DATA ANALYSIS

## Bar Plots of Barley Yield from 2000 to 2022

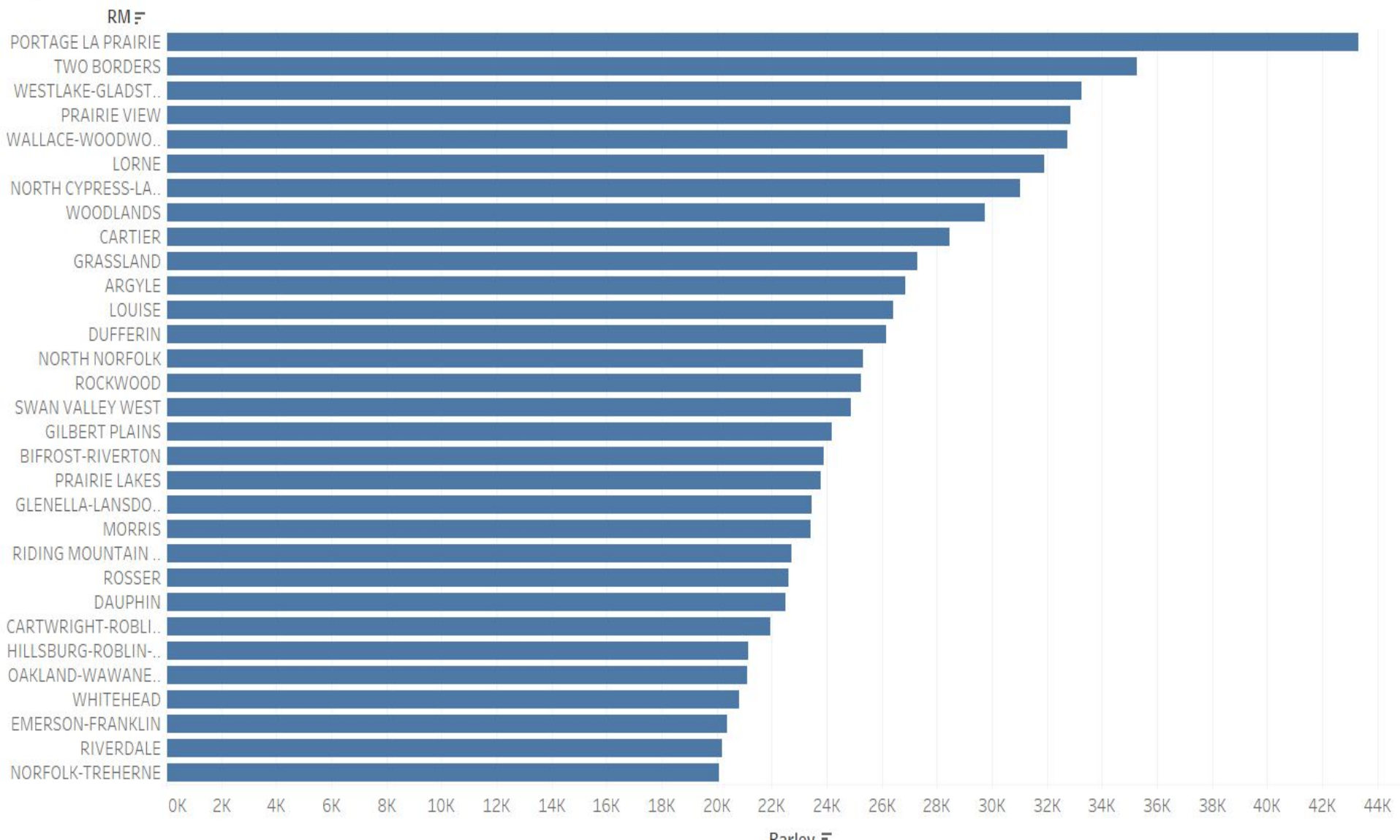
Barley Yield Trends by Year





# EXPLORATORY DATA ANALYSIS

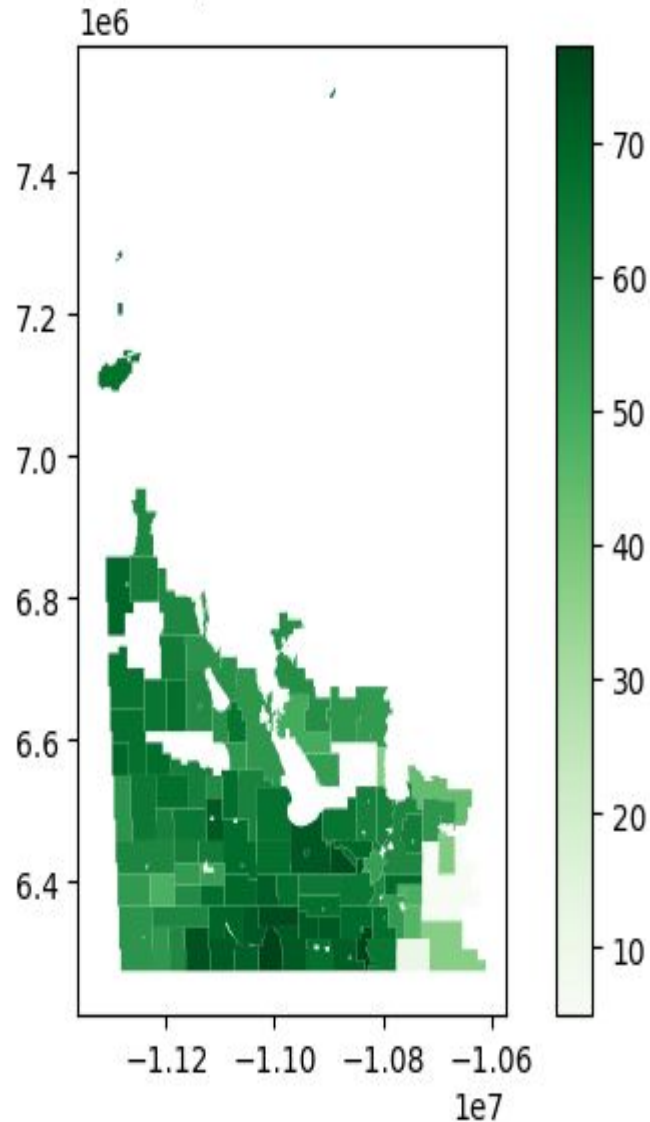
Top RMs based on Barley yields from 2000-2022



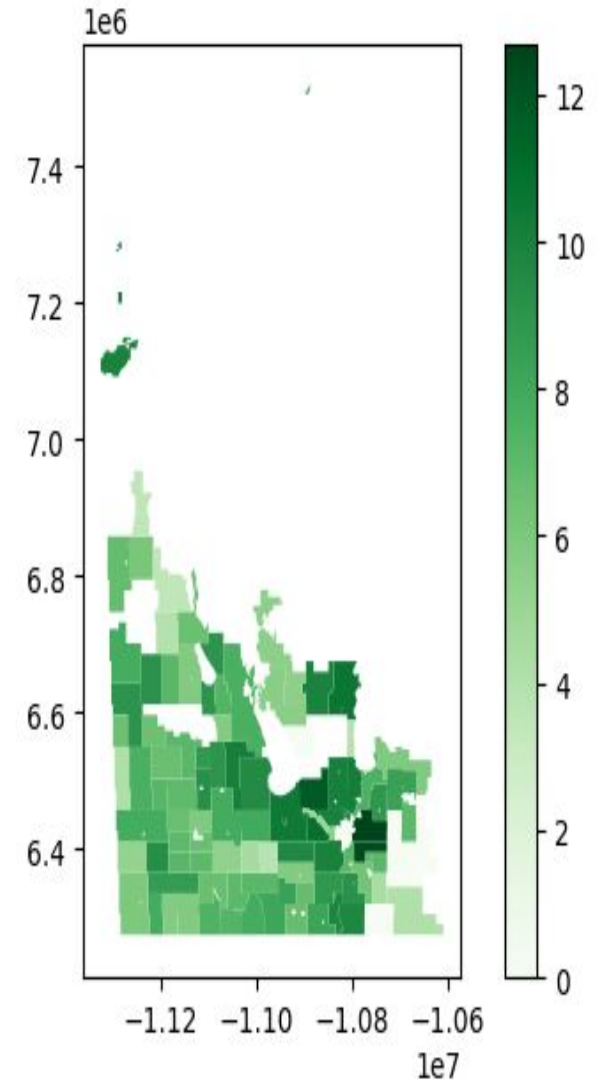


# UNSUPERVISED MACHINE LEARNING : K-MEANS CLUSTERING

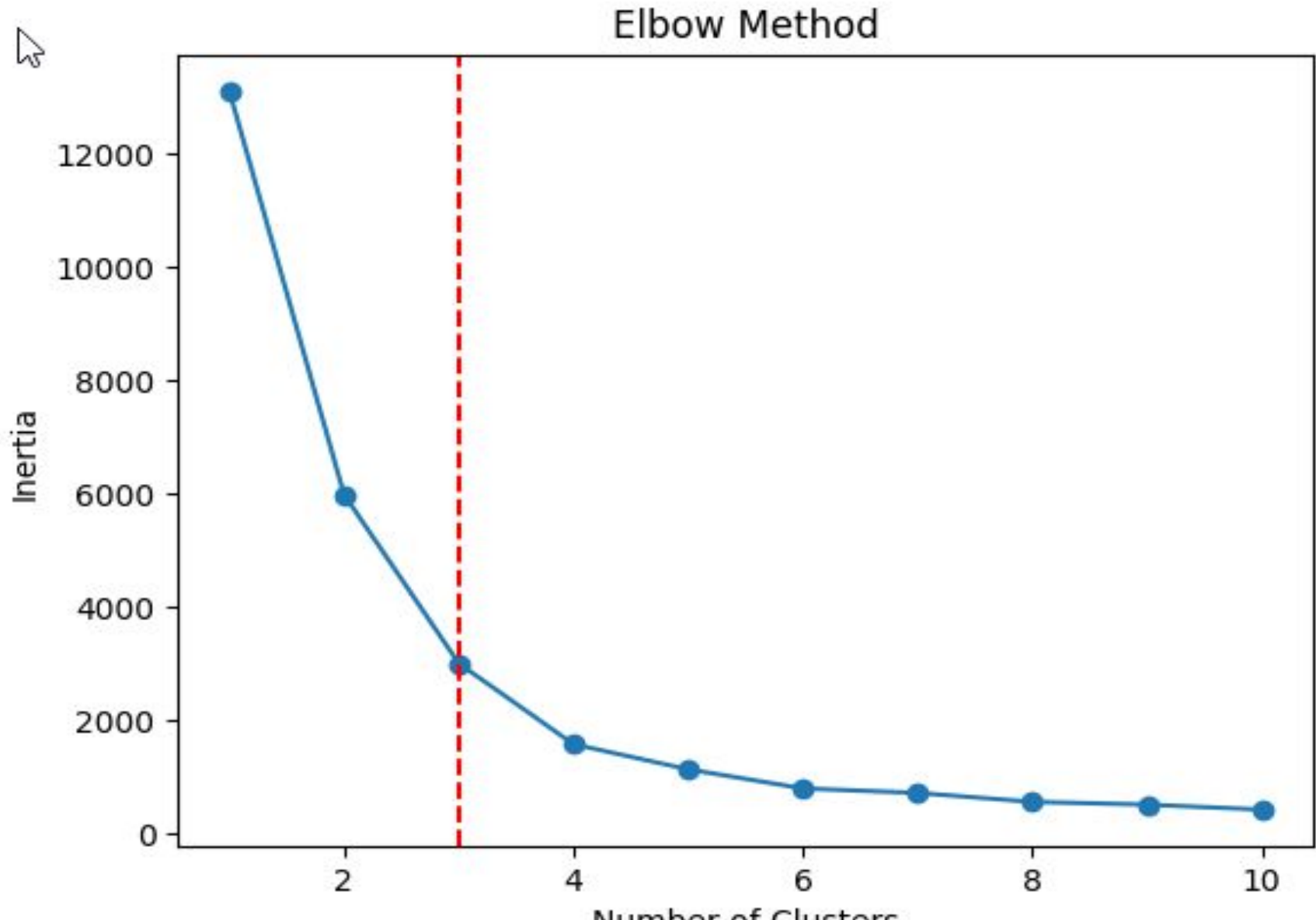
Manitoba RM Barley Yield Means from 2000-2022



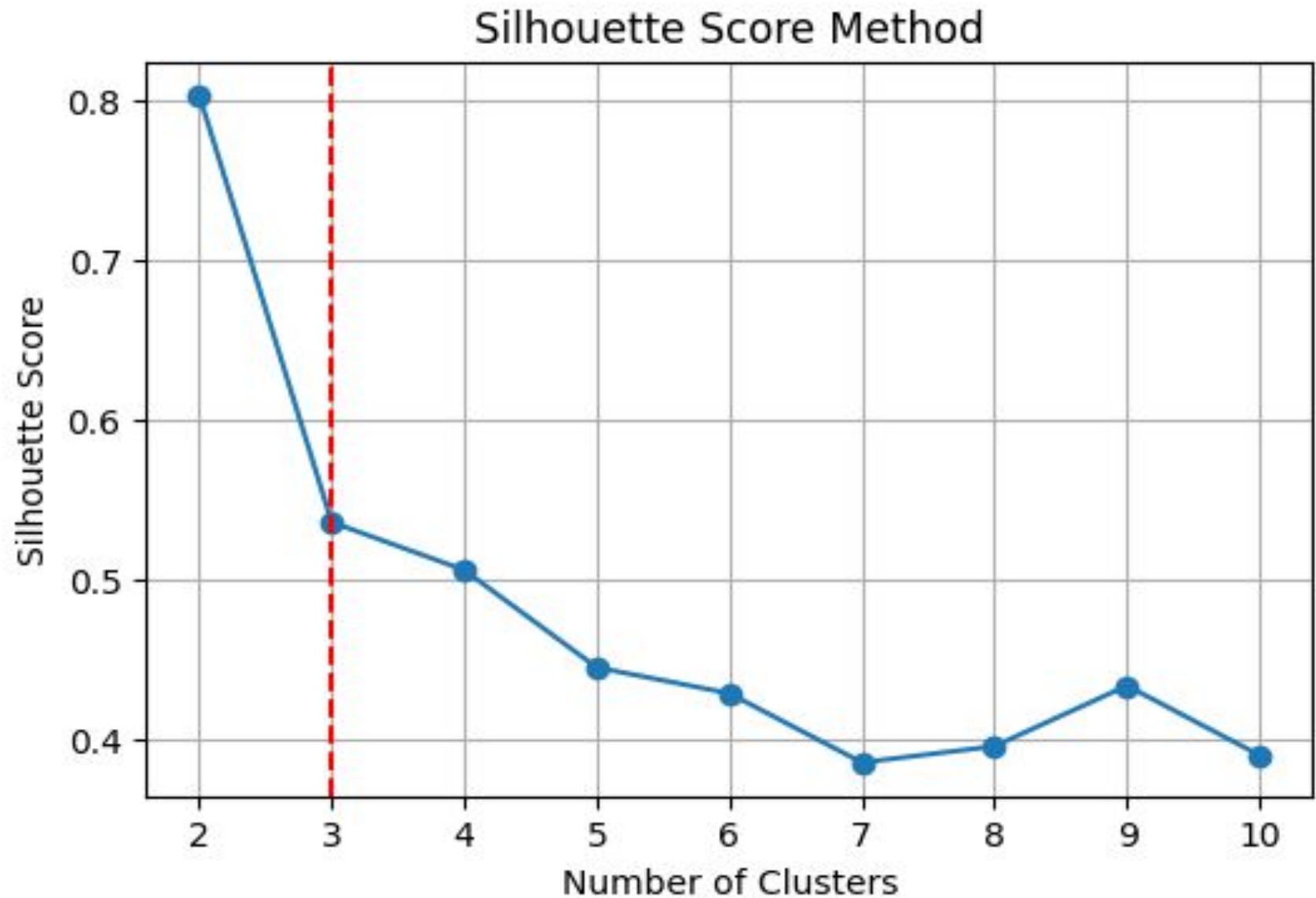
Manitoba RM Barley Yield Standard Deviations from 2000-2022



# UNSUPERVISED MACHINE LEARNING : K-MEANS CLUSTERING

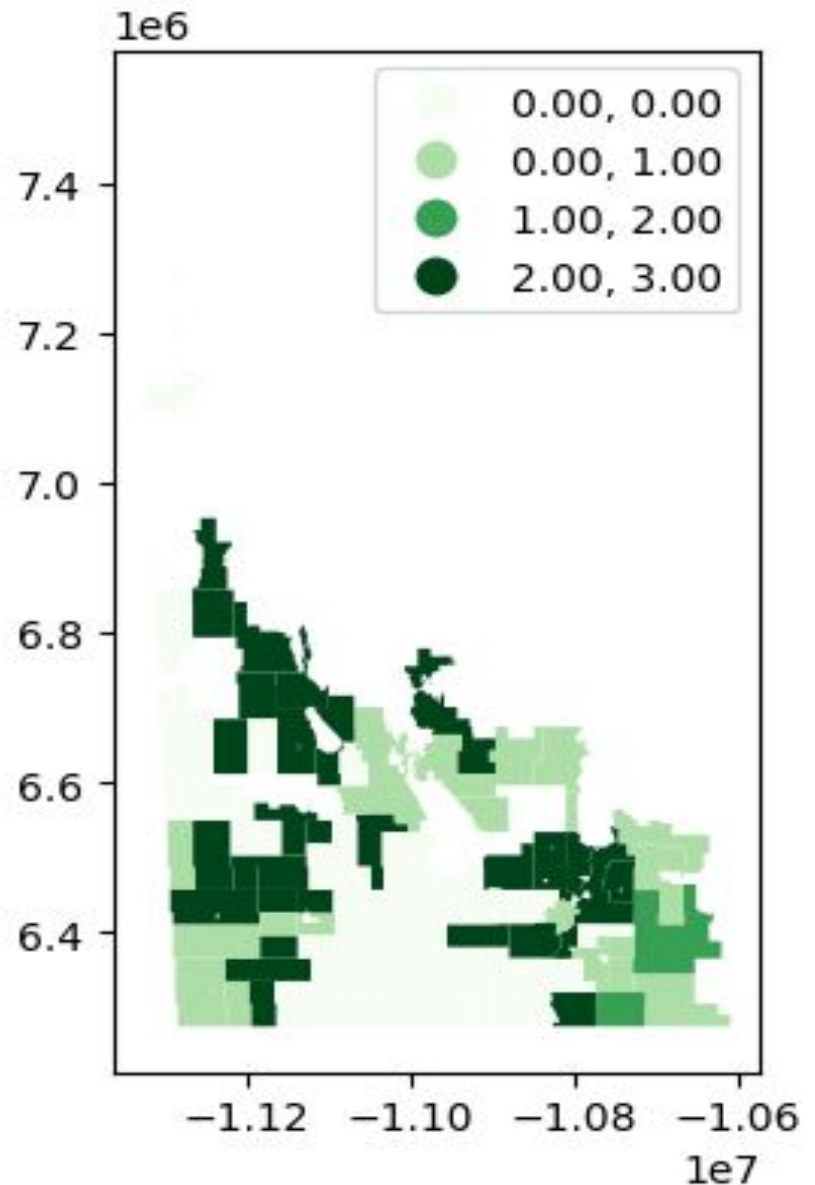
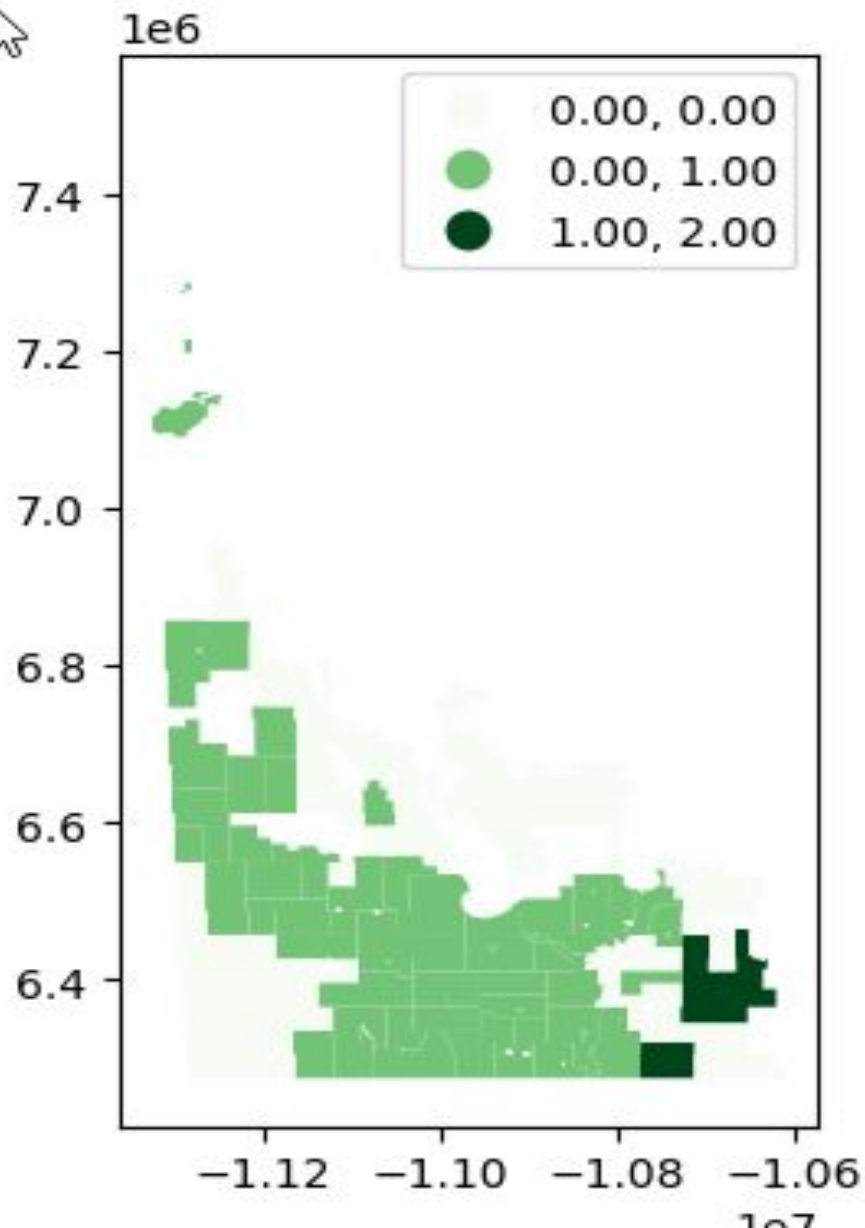


# UNSUPERVISED MACHINE LEARNING : K-MEANS CLUSTERING





# UNSUPERVISED MACHINE LEARNING : K-MEANS CLUSTERING



# RESULTS

- 01
  - Interactive Dashboard for analyzing data in Manitoba's rural municipalities.
- 02
  - [https://public.tableau.com/views/ManitobaRMs-BarleyYieldsAnalysis/BarleyDashboard?:language=en-US&publish=yes&:sid=&:display\\_count=n&:origin=viz\\_share\\_link](https://public.tableau.com/views/ManitobaRMs-BarleyYieldsAnalysis/BarleyDashboard?:language=en-US&publish=yes&:sid=&:display_count=n&:origin=viz_share_link)
- 03
  - Able to find 3 and 4 clusters of Barley yields in Manitoba RMs
- 04
  - Visualizations for Spatial map with color coding, Line chart with Barley yields, Bar chart to find Top RMs in Manitoba with historical Barley yields.



## CONCLUSIONS & FUTURE WORK

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- It is possible to cluster Manitoba RMs based on Barley yield mean and standard deviation. Different clusters were created.
- Spatial patterns of yields
- Trend in data
- Explore a similar approach to the soil type map of Manitoba.
- Try DBSCAN for dissimilar RMs in Manitoba.





**THANK YOU**