



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

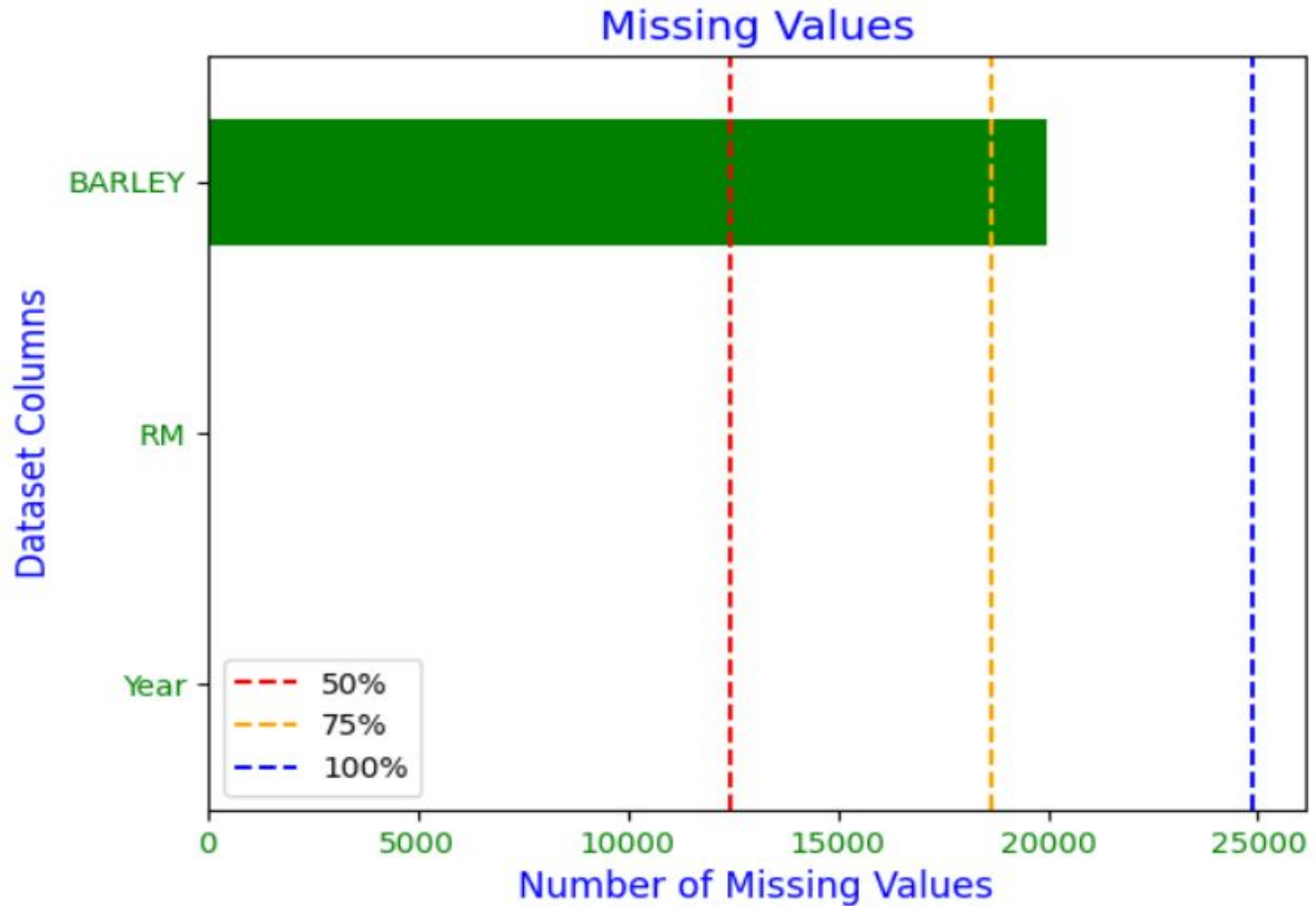


DATA COLLECTION & PREPROCESSING

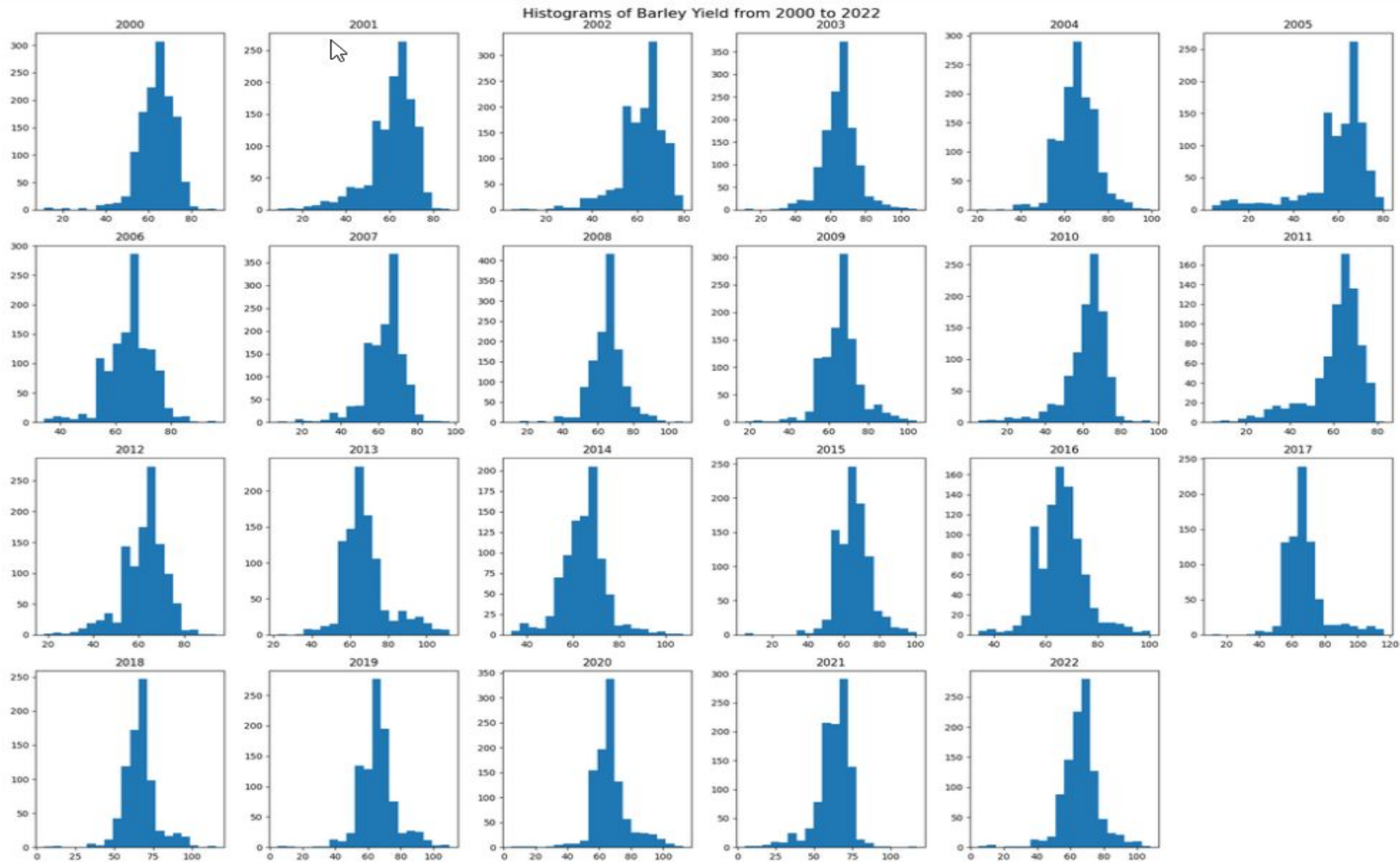
- Manitoba Crop Yields :
https://www.masc.mb.ca/masc.nsf/mmpp_browser_soil_types.html
- Geographical Boundaries of Manitoba Rural Municipalities:
<https://geoportal.gov.mb.ca/datasets/8b64285c3bf6445a8d0d8ea4a1c43849/explore?location=53.584348%2C-97.779011%2C6.81>
- Crop Yields from 2000-2022
- 11 crops : 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



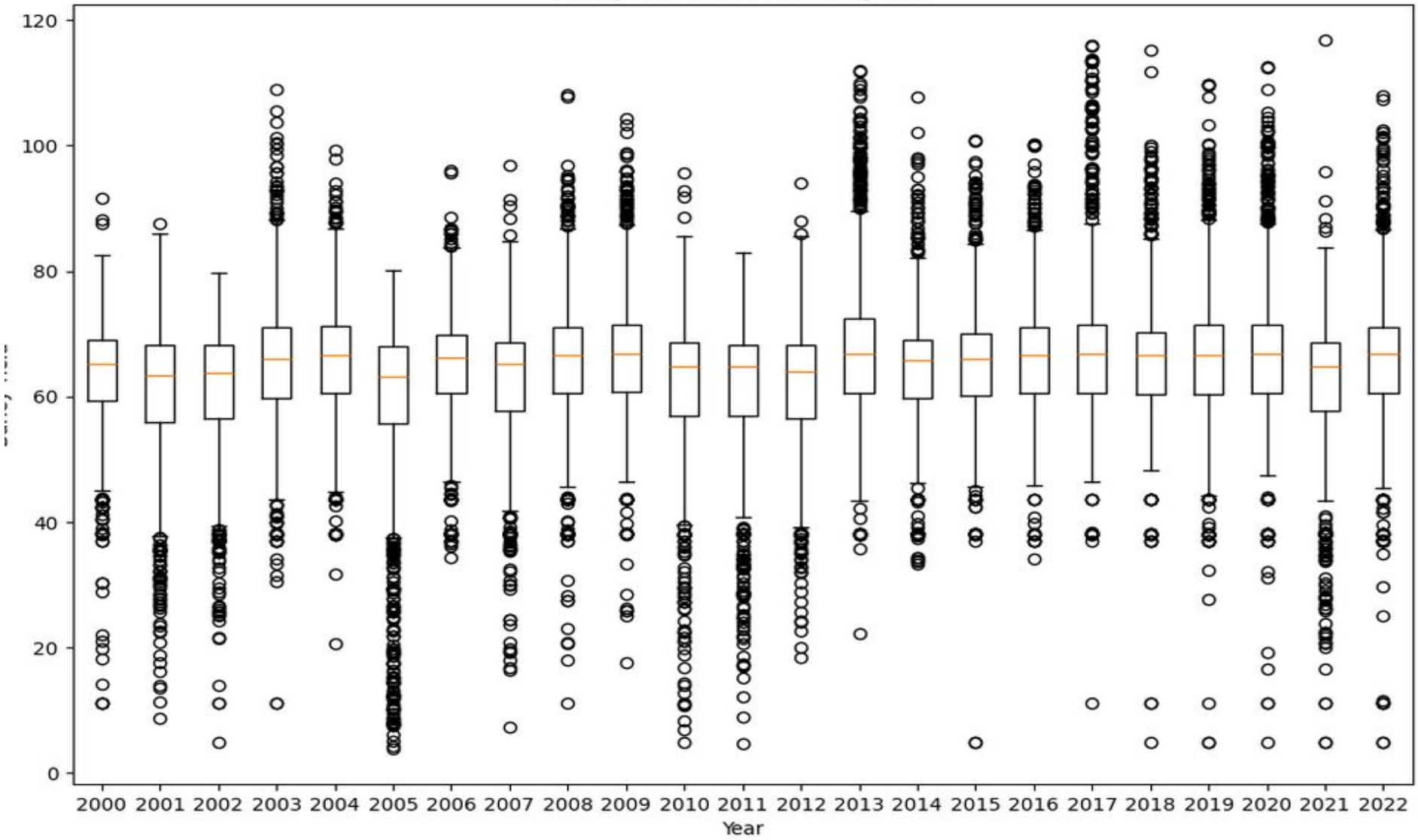
EXPLORATORY DATA ANALYSIS



EXPLORATORY DATA ANALYSIS

Box Plots of Barley Yield from 2000 to 2022

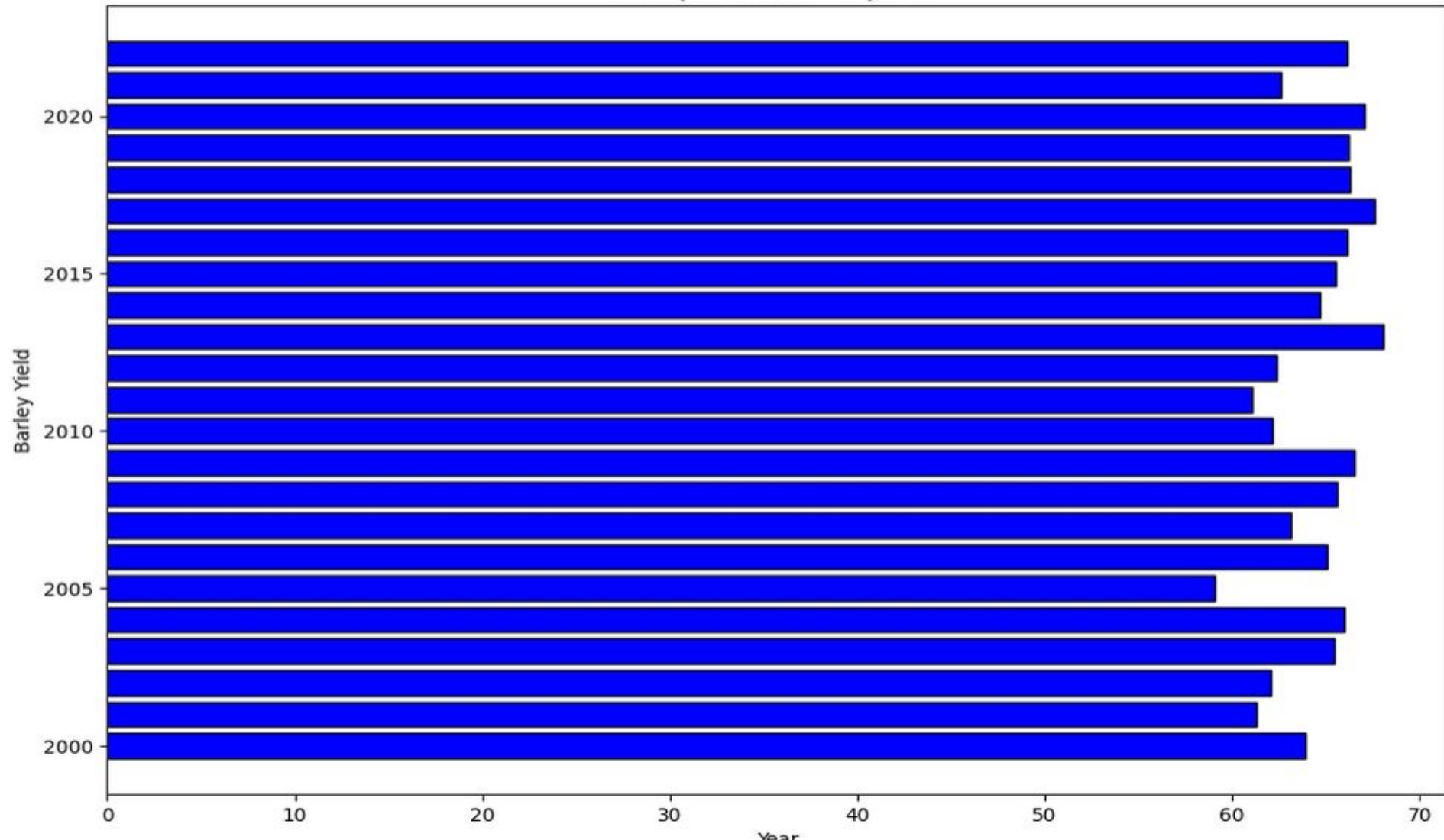
Barley Yield Distribution by Year



EXPLORATORY DATA ANALYSIS

Bar Plots of Barley Yield from 2000 to 2022

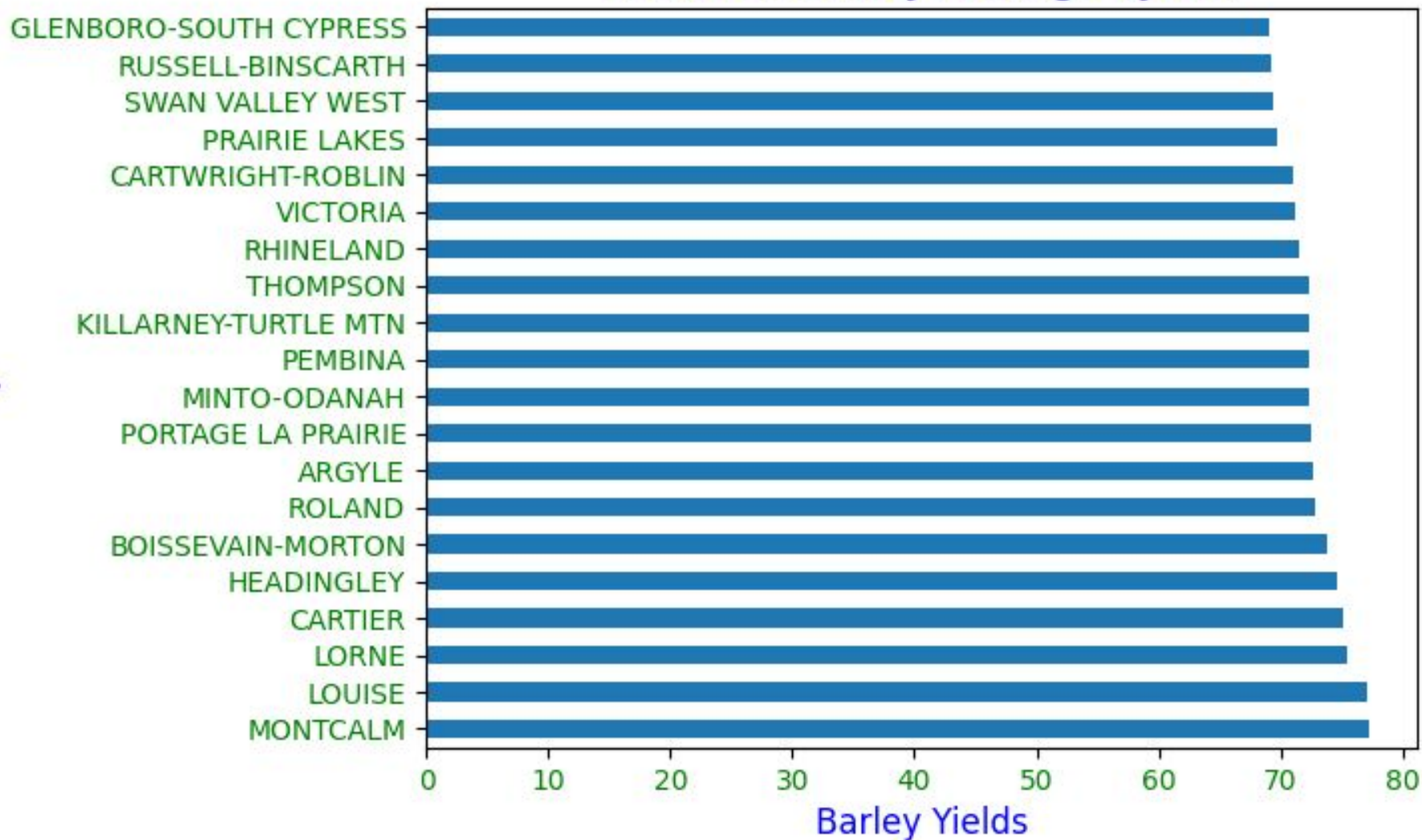
Barley Yield Trends by Year



EXPLORATORY DATA ANALYSIS

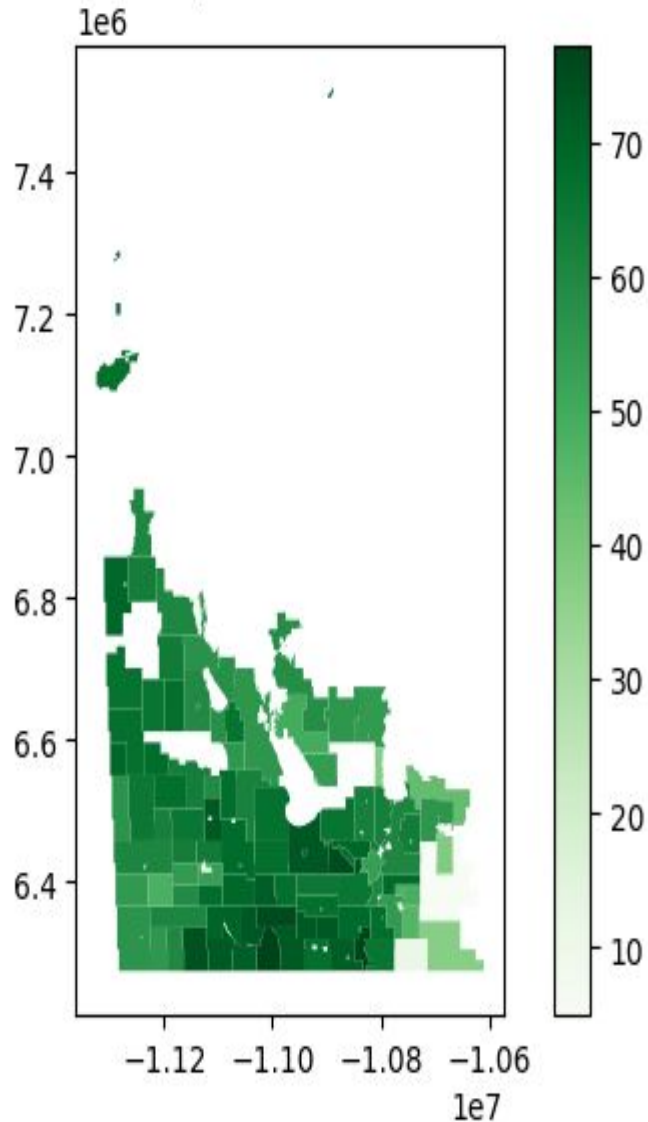
Historical Barley Average by RM

Municipalities

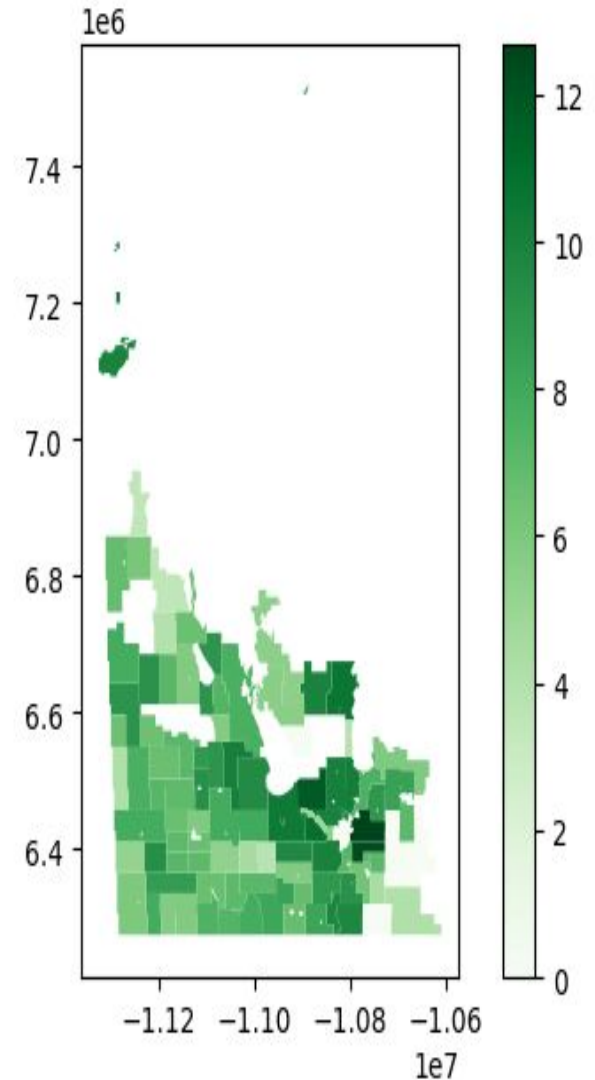


UNSUPERVISED MACHINE LEARNING : K-MEANS CLUSTERING

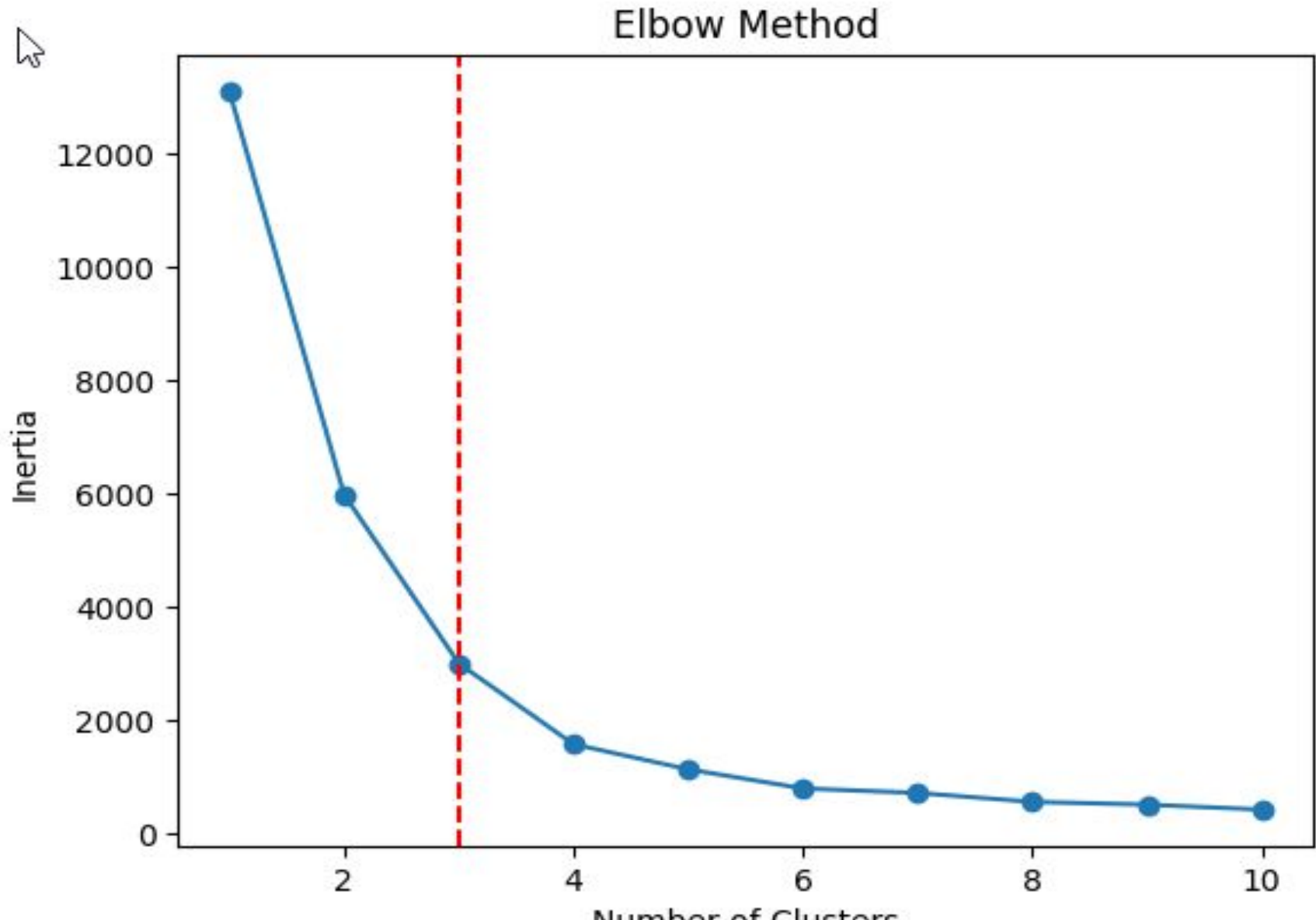
Manitoba RM Barley Yield Means from 2000-2022



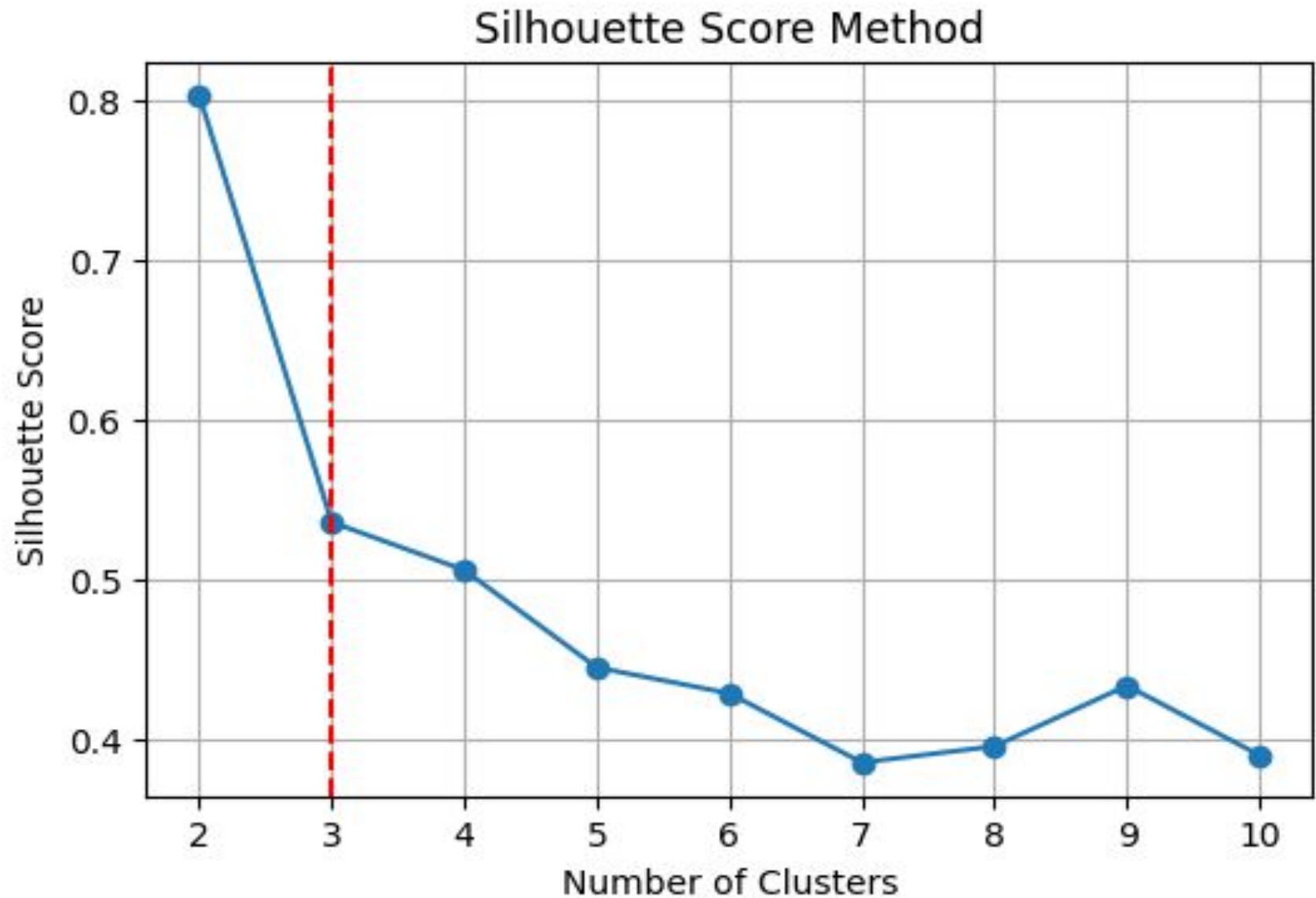
Manitoba RM Barley Yield Standard Deviations from 2000-2022



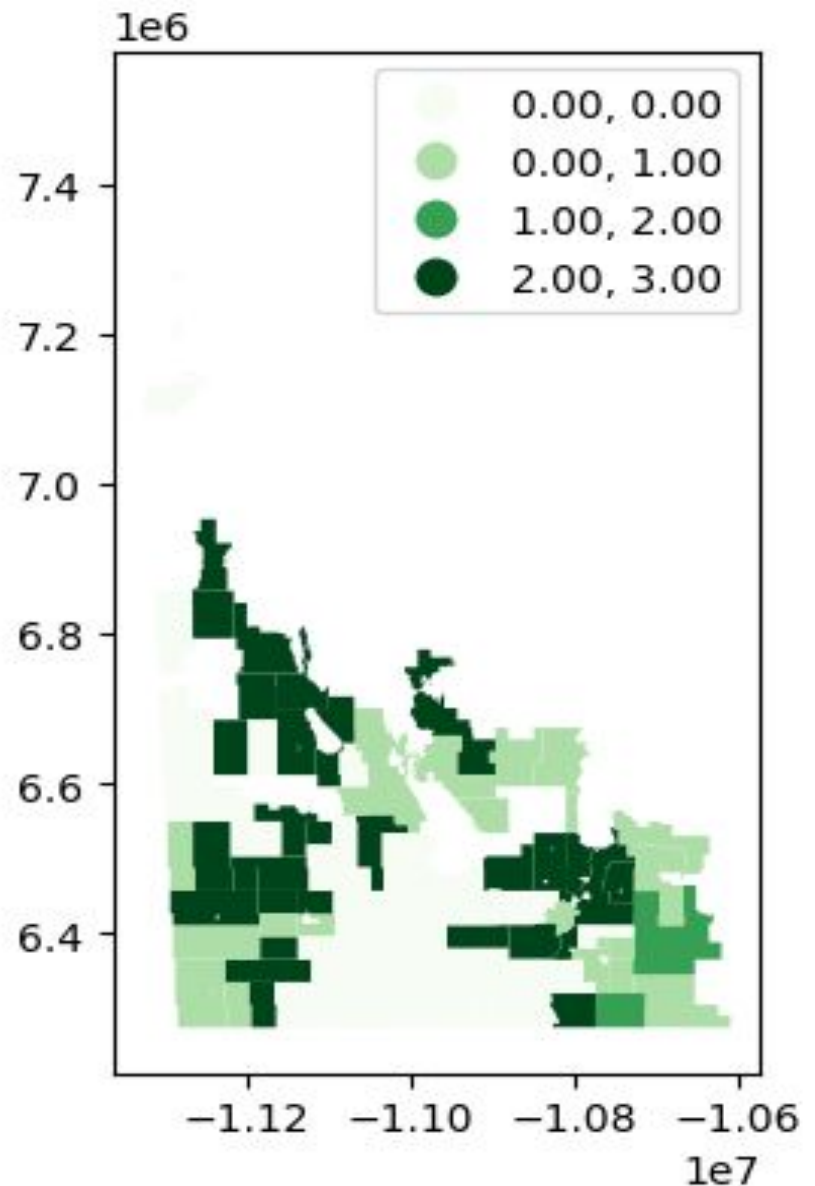
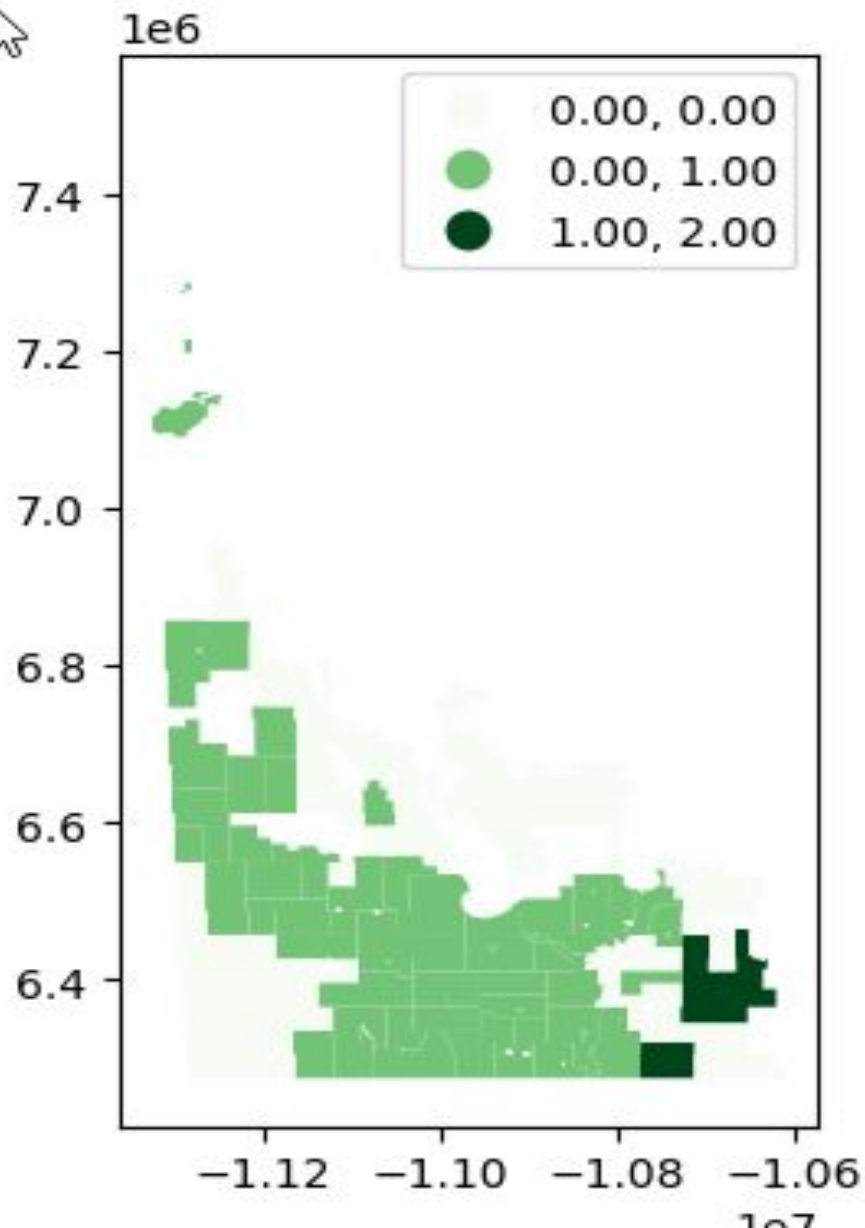
UNSUPERVISED MACHINE LEARNING : K-MEANS CLUSTERING



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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
- 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

- 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