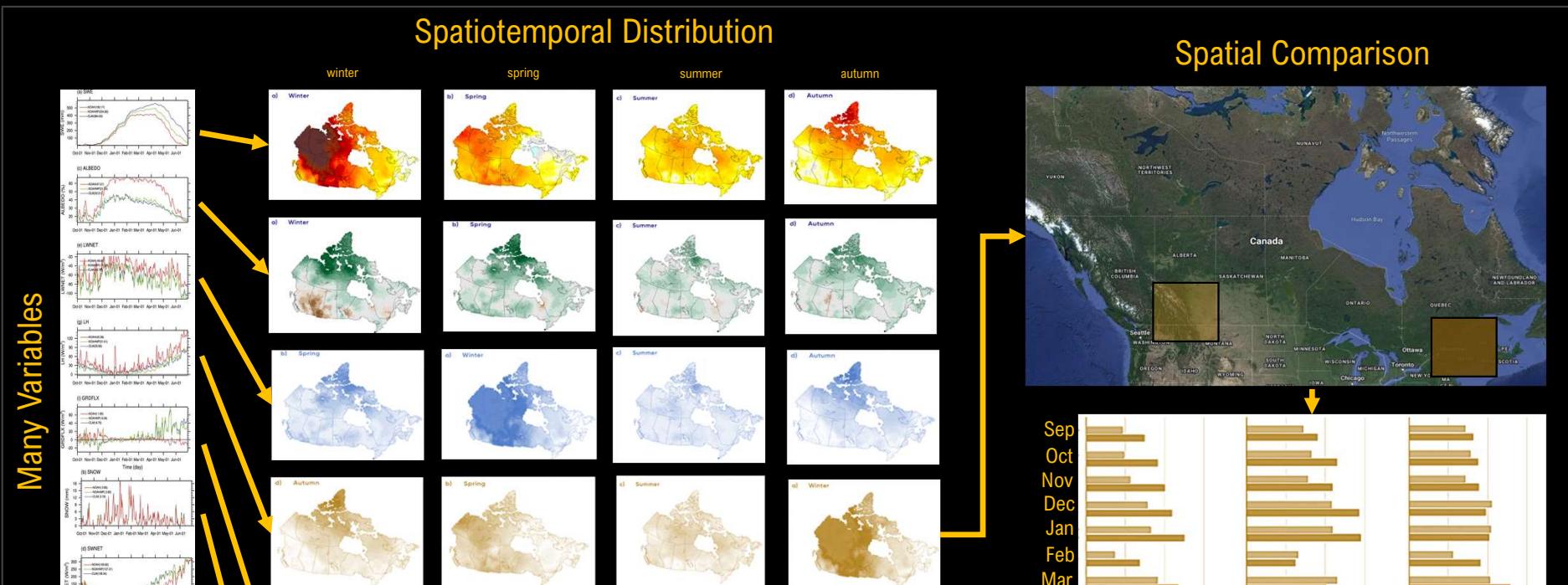


SET-STAT-MAP: Extending Parallel Sets for Visualizing Mixed Data

Debajyoti Mondal

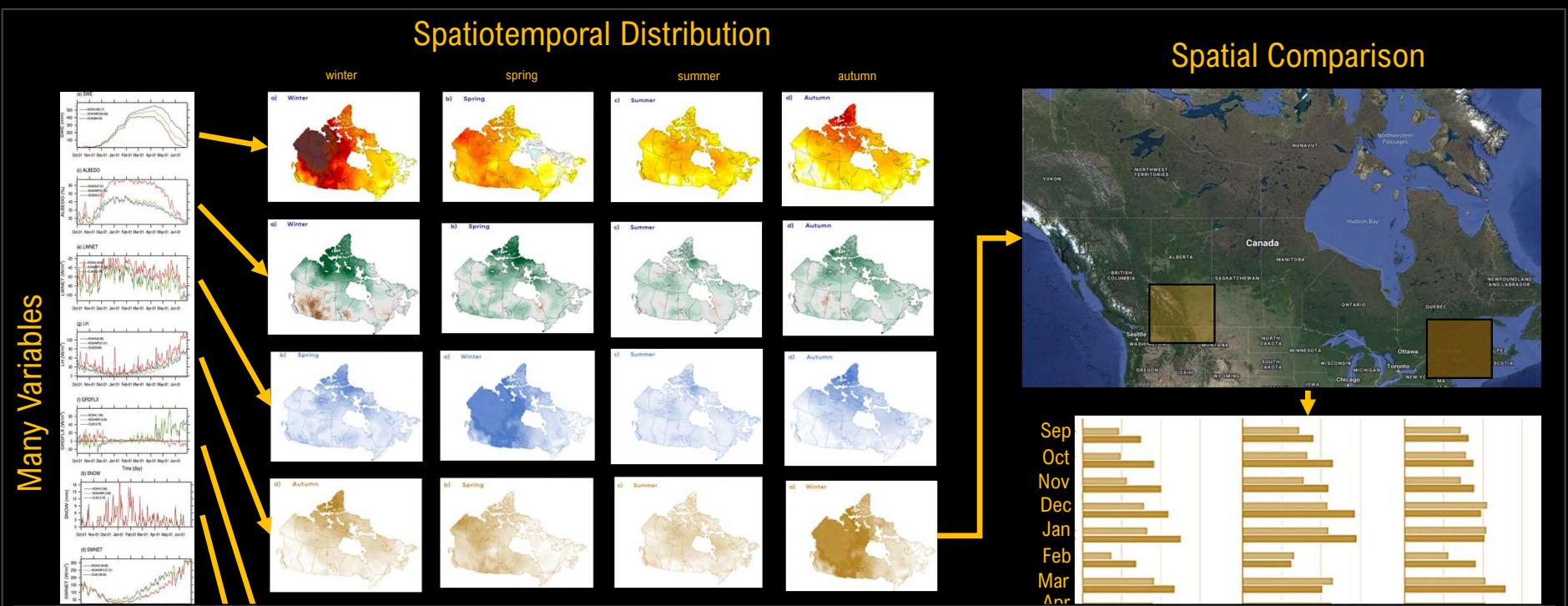
Analyzing Mixed Data



Multiple Variables X Temporal Trends X Spatial Distribution = Number of combinations

10 Variables X 12 months X 2 locations = 240 combinations

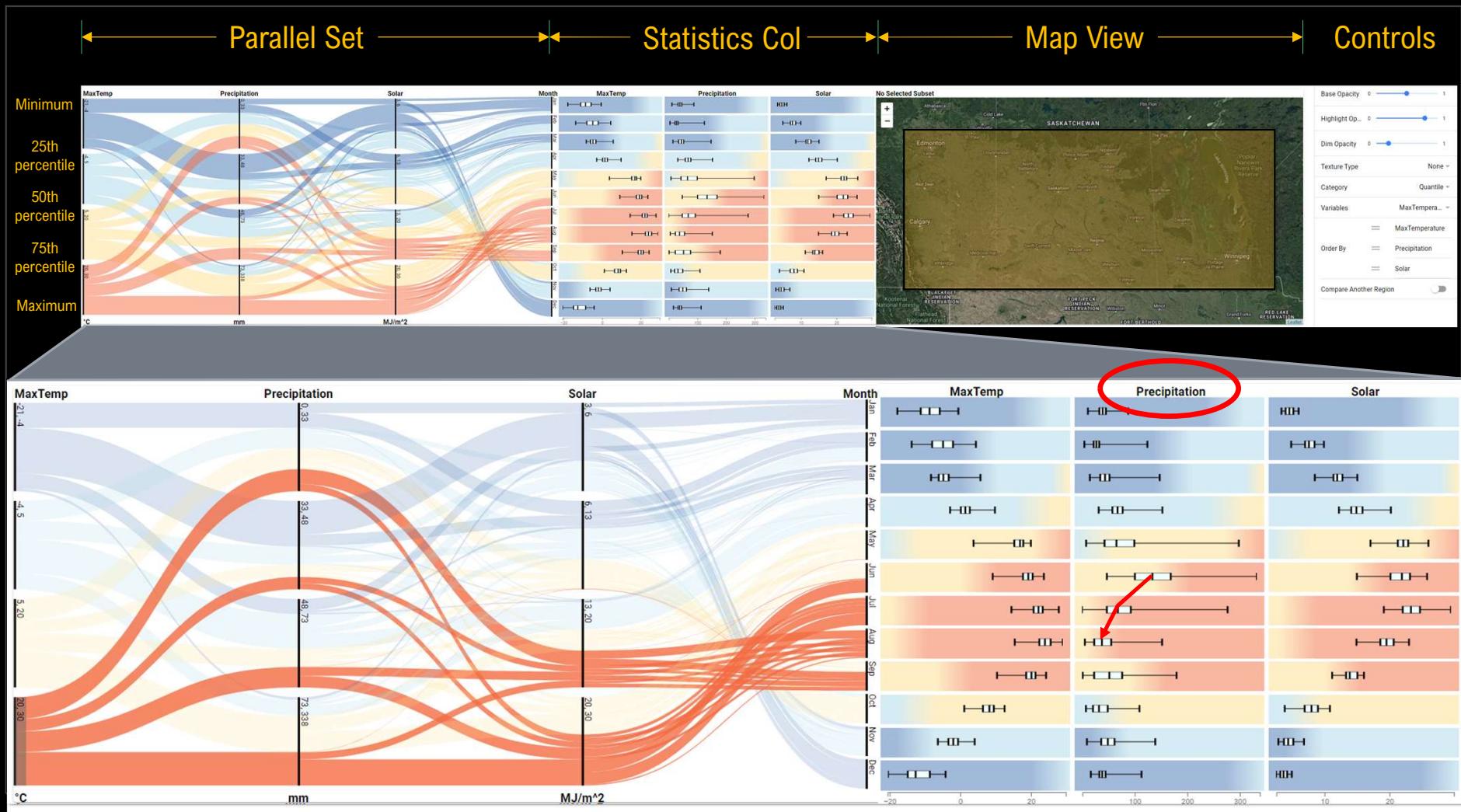
Class Activity: Design a Par-Co plot (for 2 variables, 12 months)



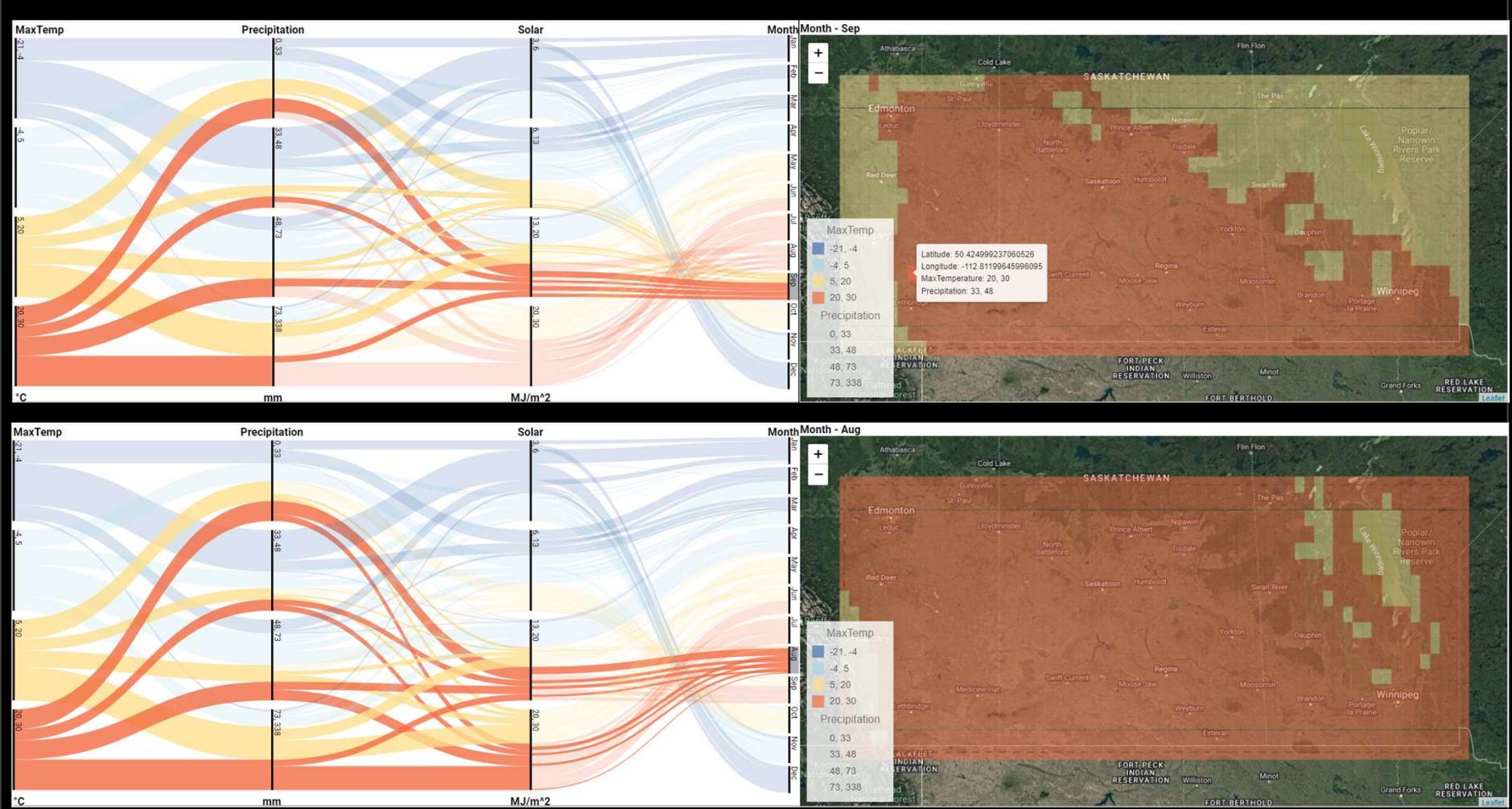
Multiple Variables X Temporal Trends X Spatial Distribution = Number of combinations

10 Variables X 12 months X 2 locations = 240 combinations

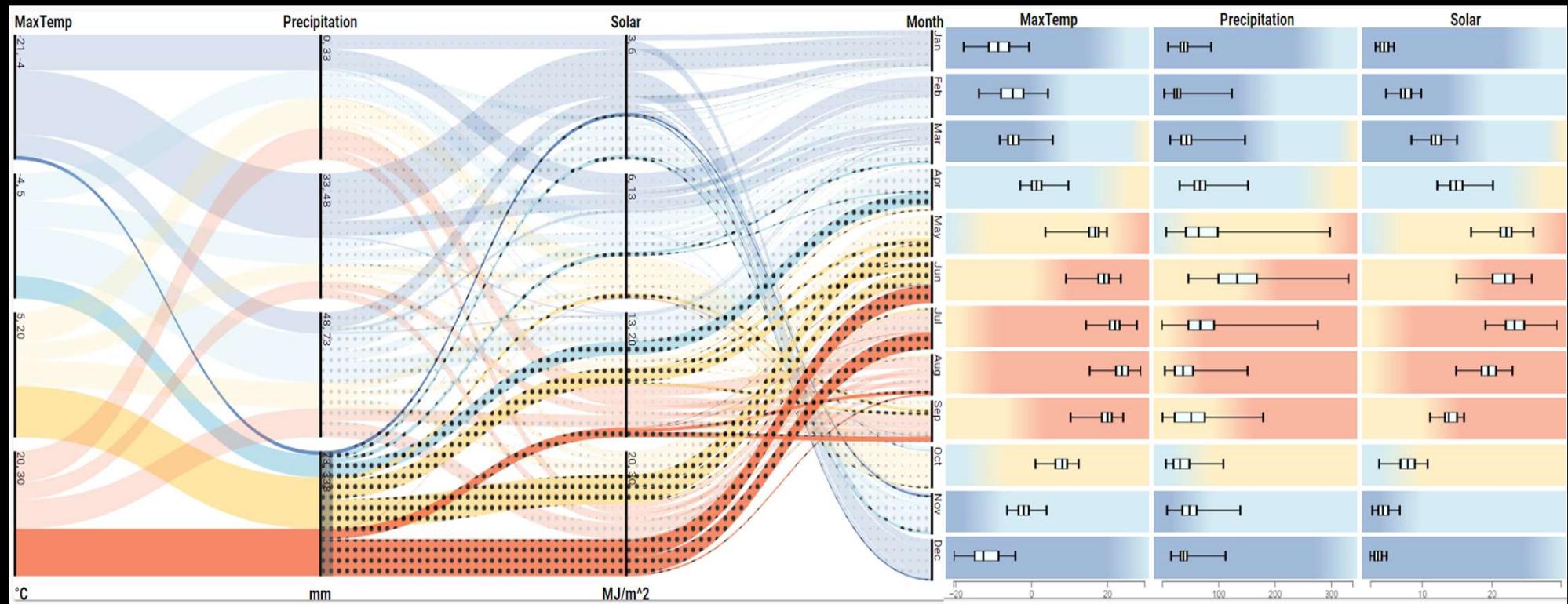
SET-STAT-MAP



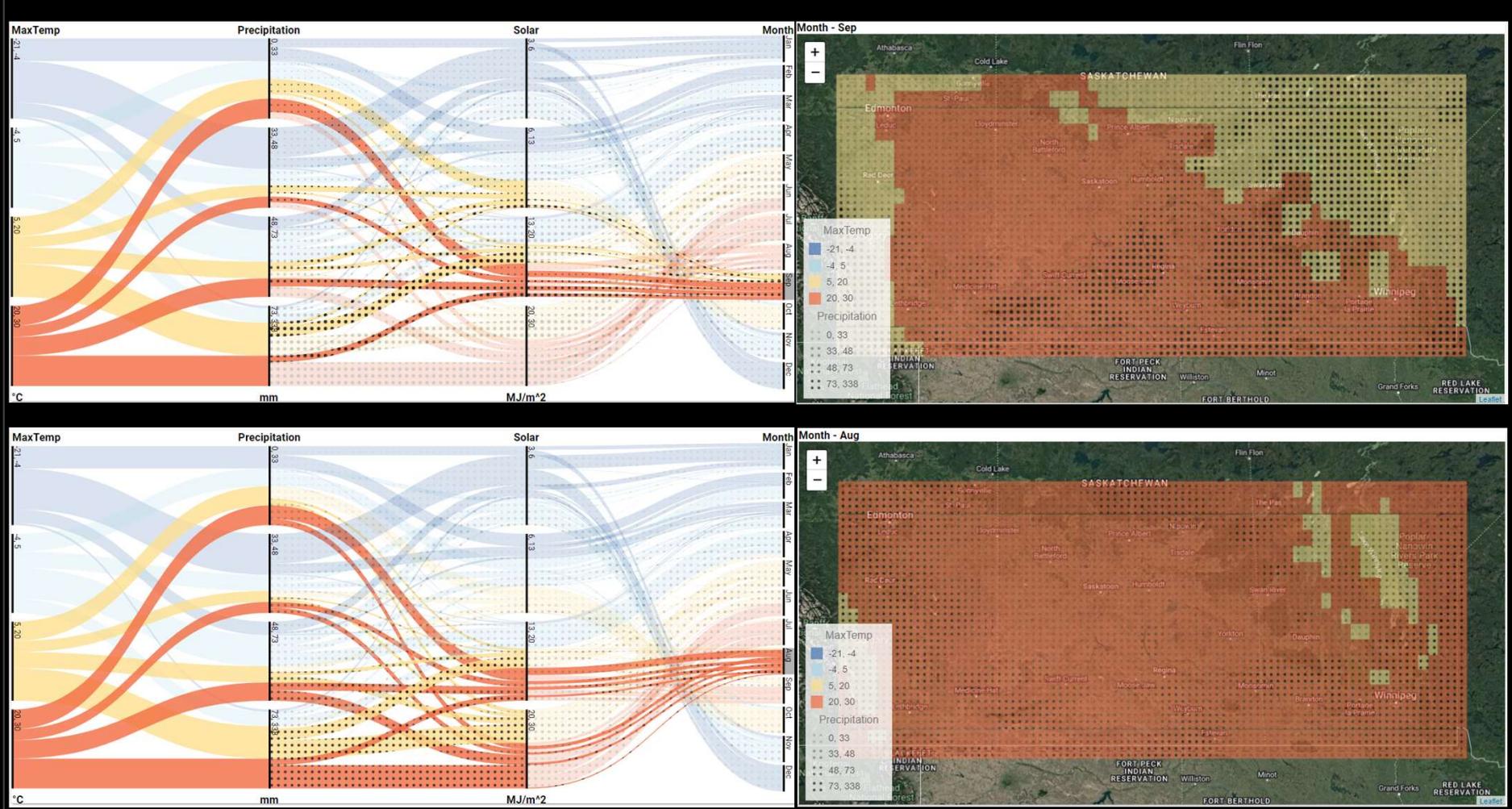
SET-STAT-MAP (Spatial Distribution over Time)



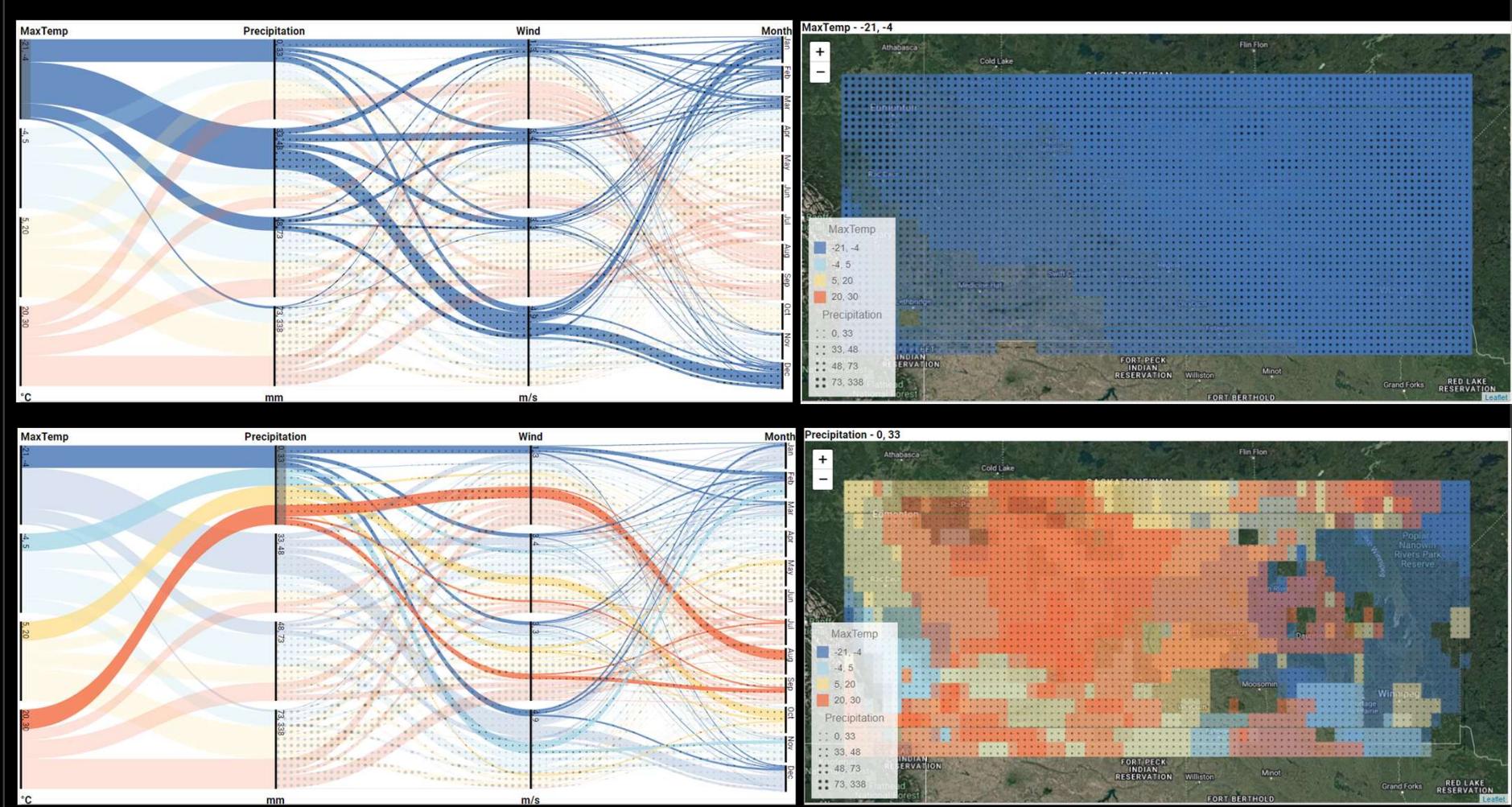
SET-STAT-MAP (Texture Augmentation)



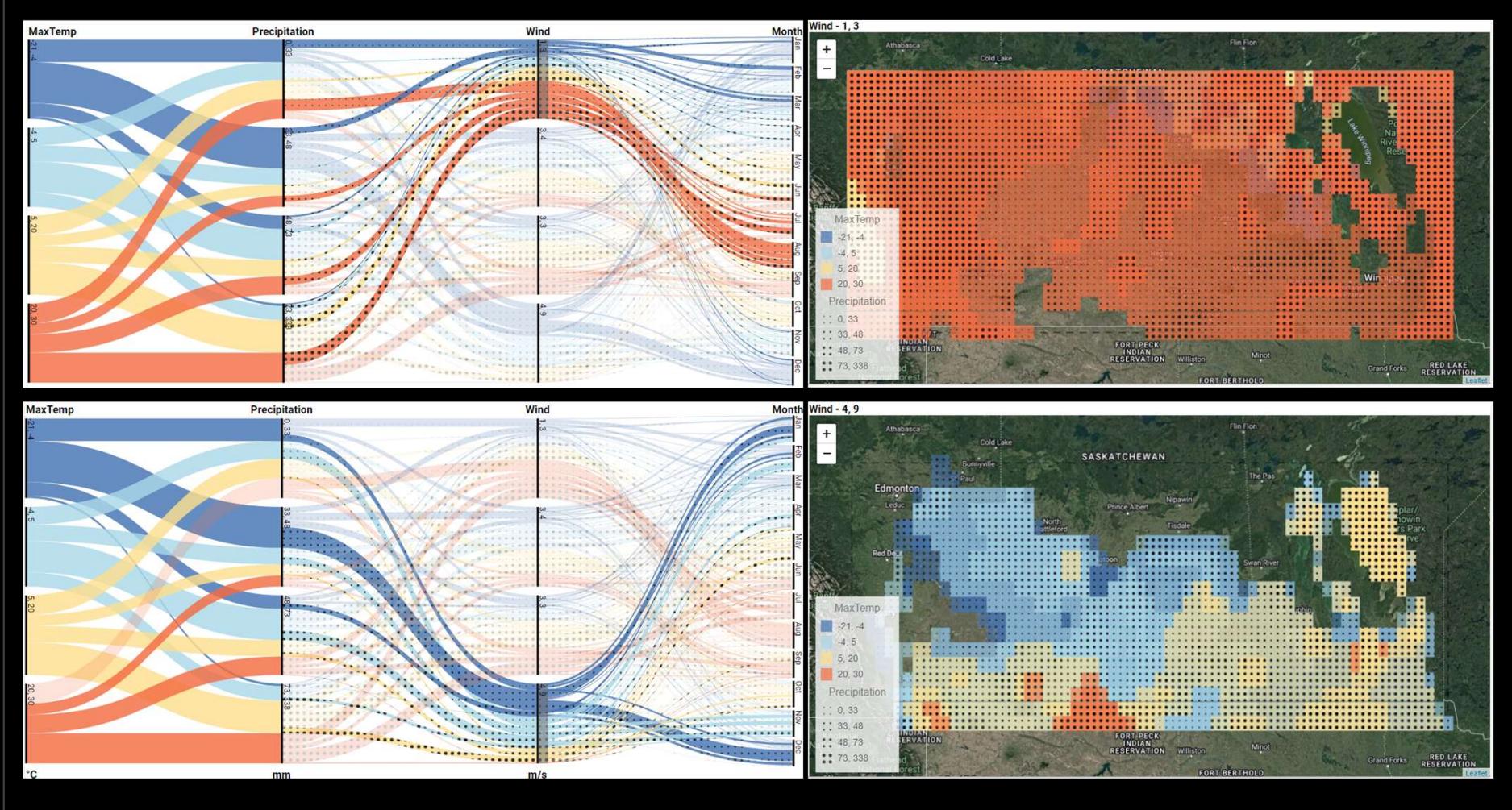
SET-STAT-MAP (Texture Augmentation)



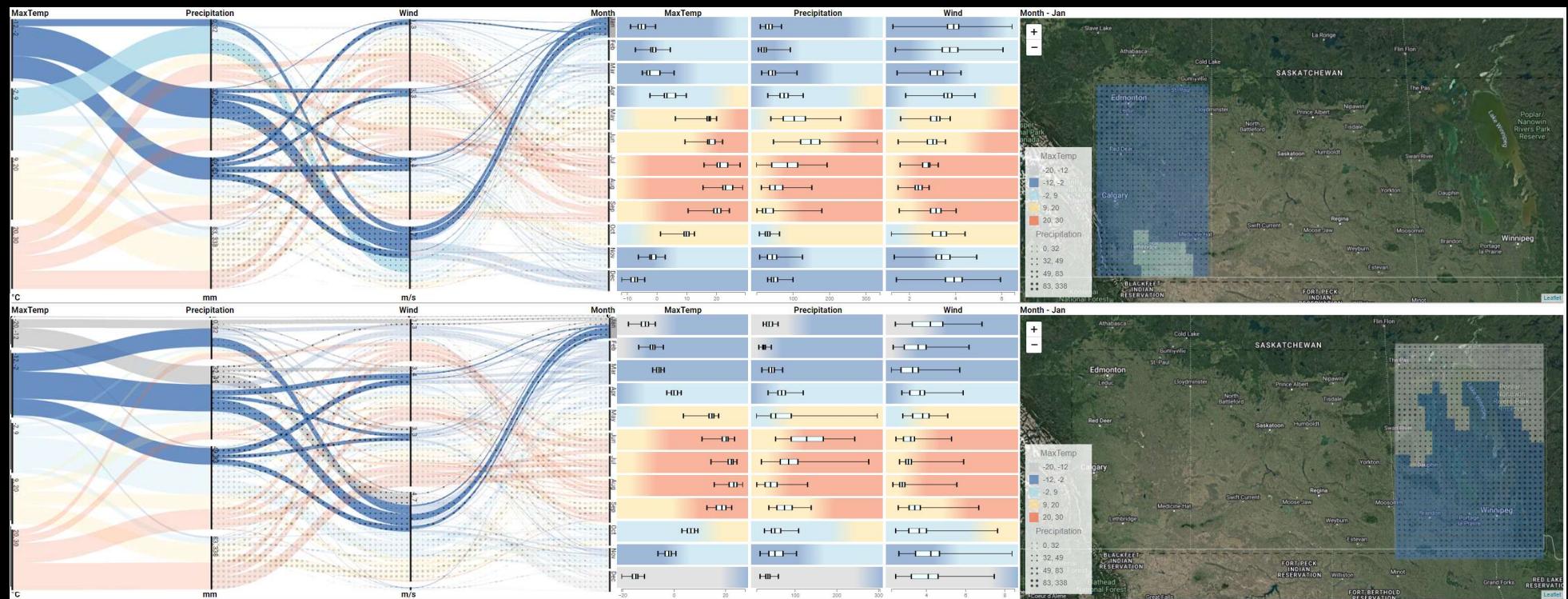
SET-STAT-MAP (Texture Augmentation)



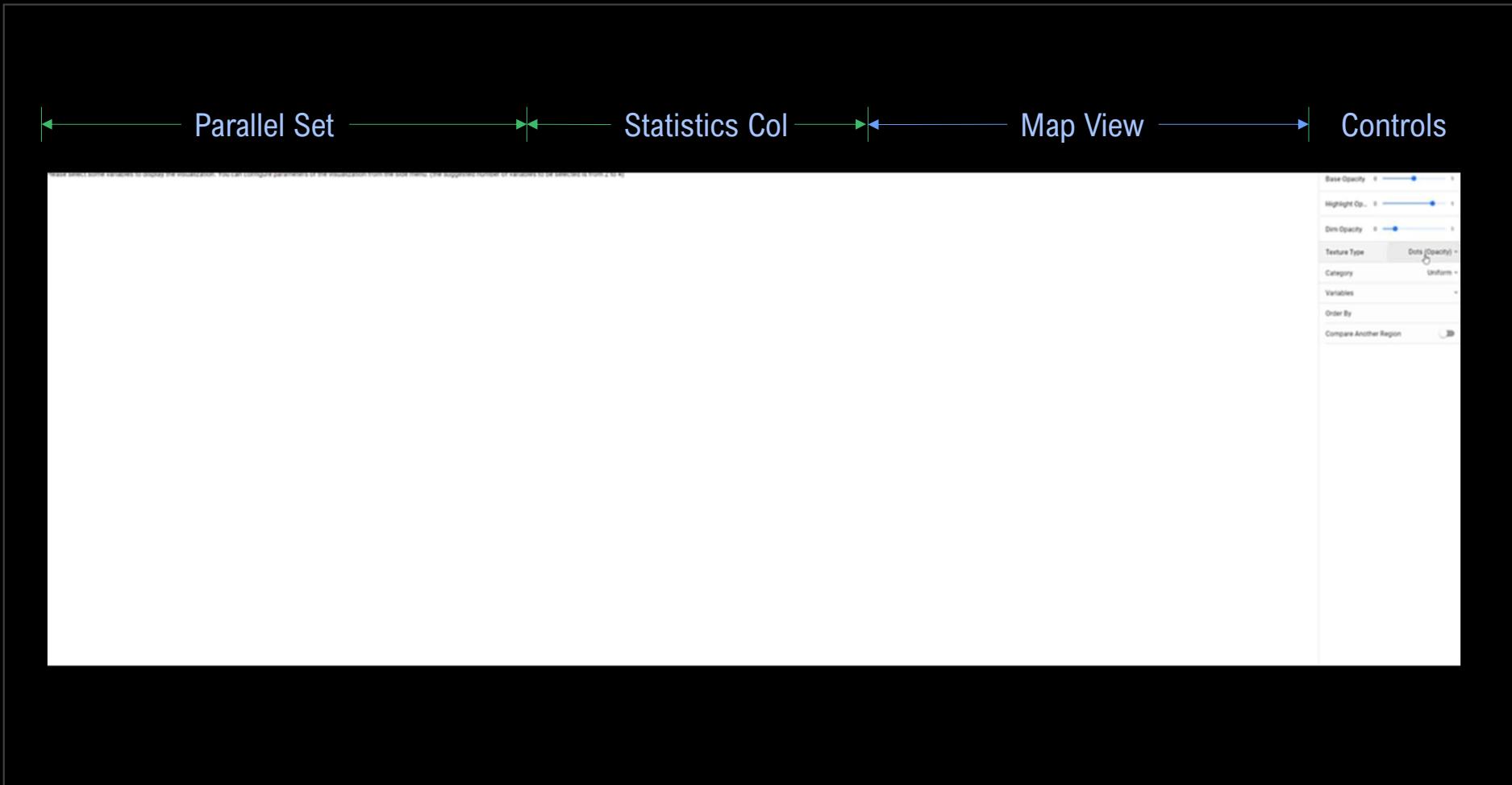
SET-STAT-MAP (Texture Augmentation)



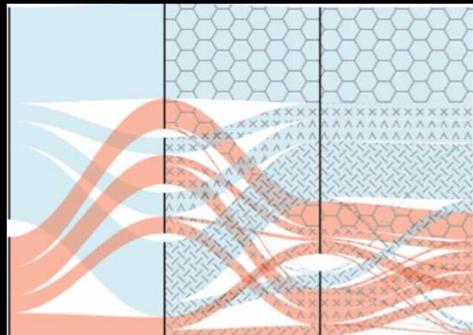
SET-STAT-MAP (Comparing Two Regions)



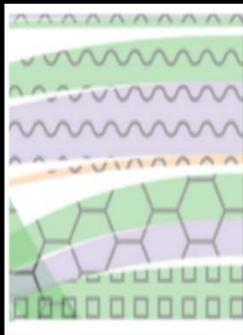
SET-STAT-MAP – Typical Interactions



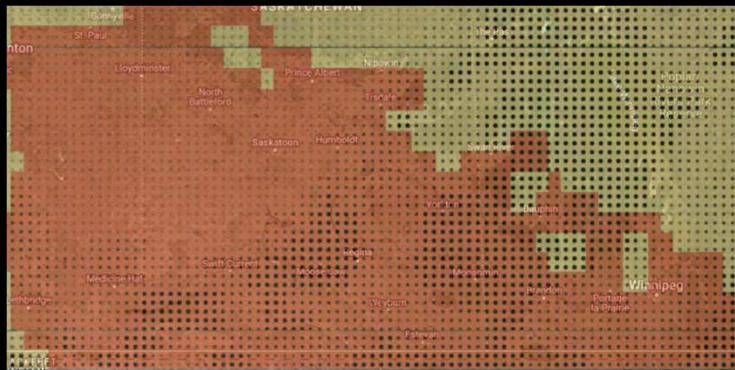
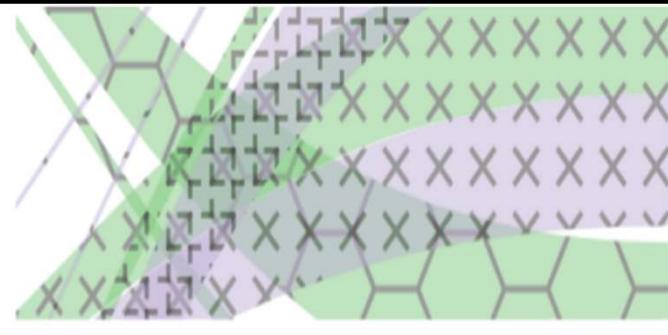
SET-STAT-MAP (Texture Choice)



Arbitrary textures →



Texture Cut off and Clutter

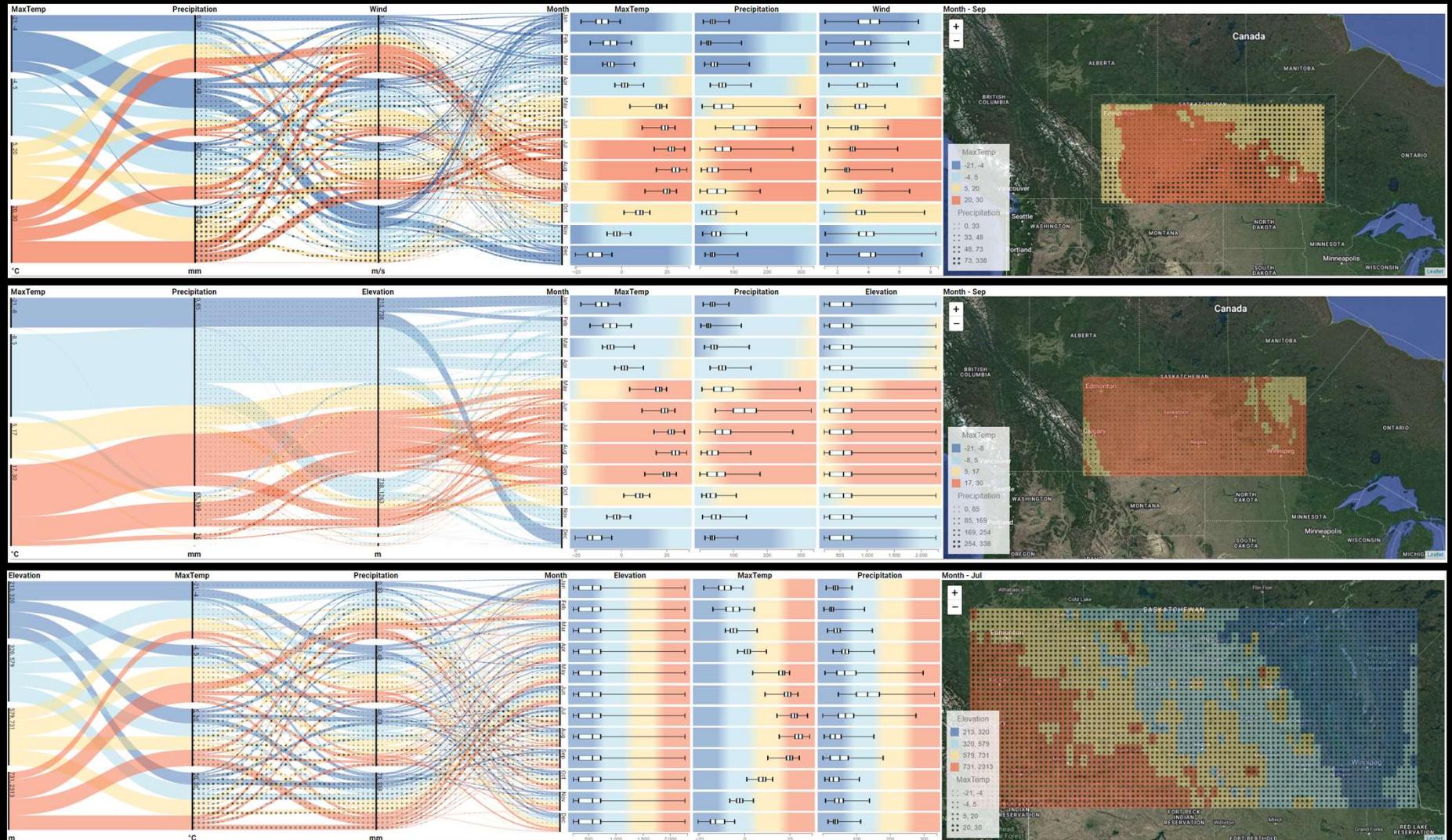


Higher prec ~ larger radii

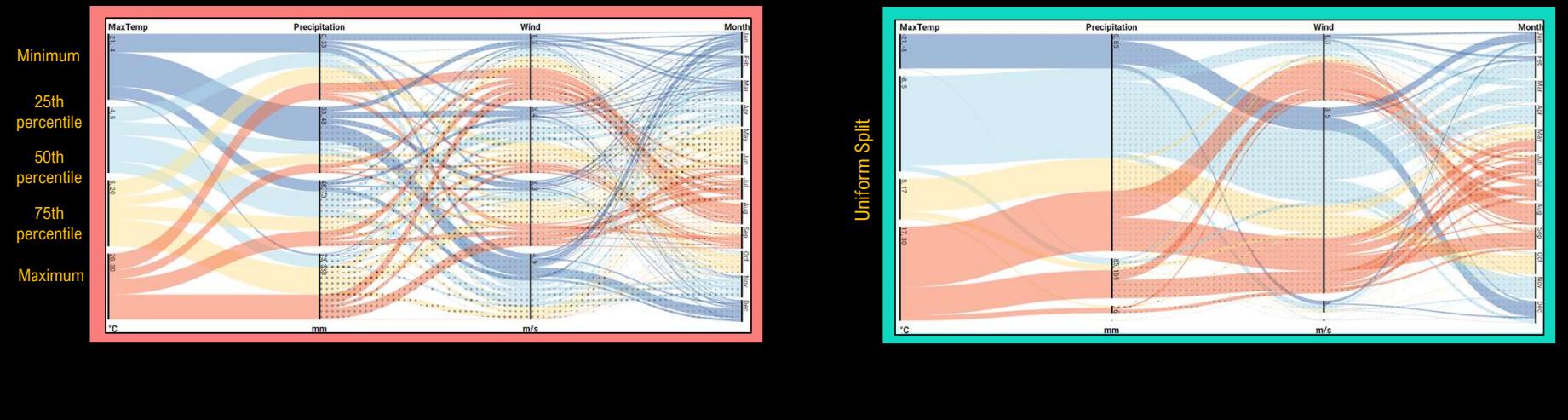
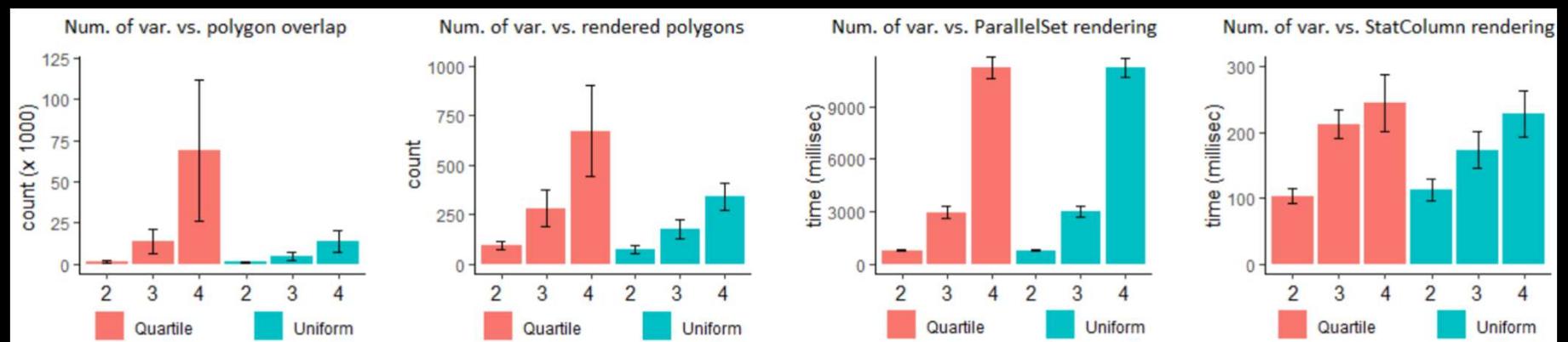


Higher prec ~ higher opacity

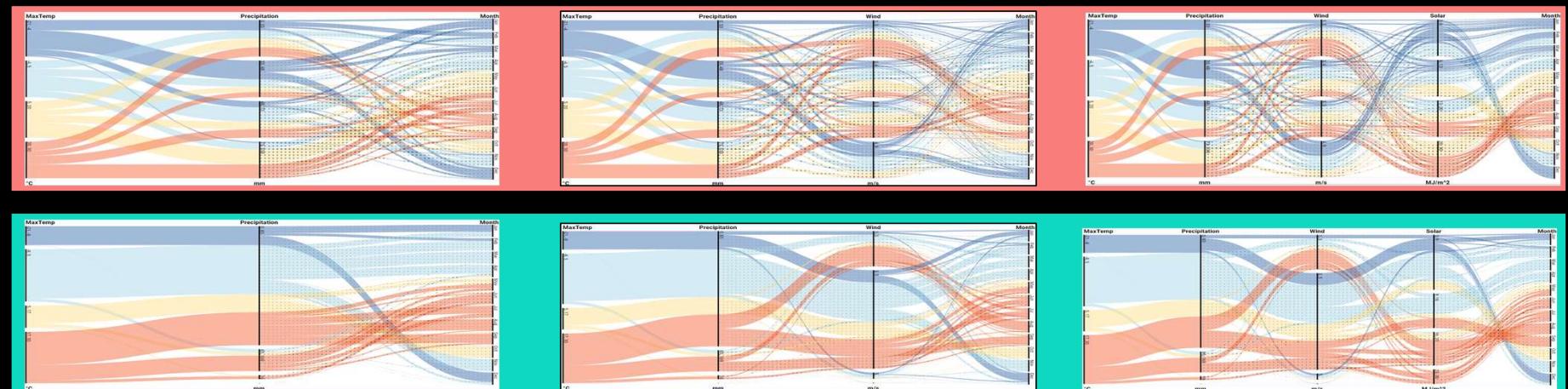
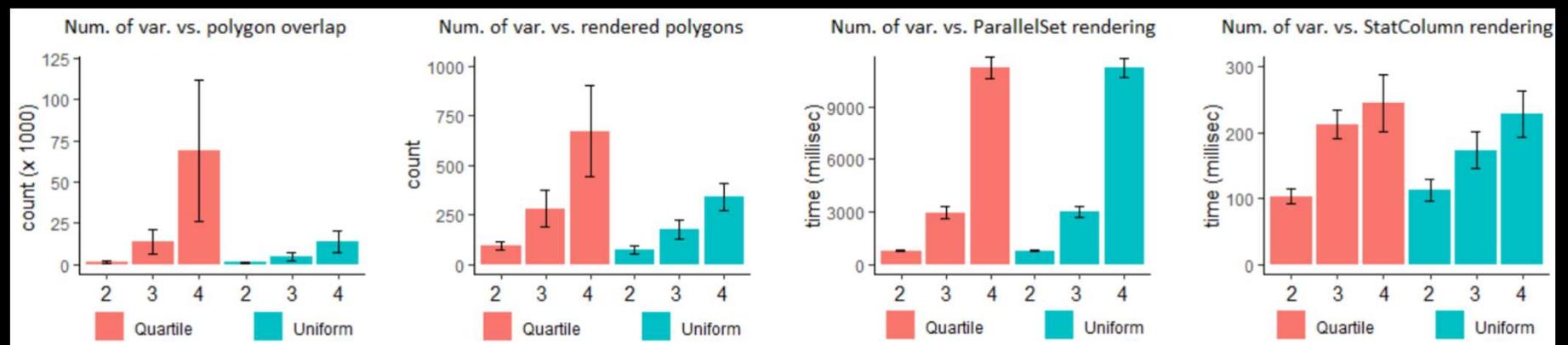
SET-STAT-MAP (Choice of Axis)



SET-STAT-MAP (Scalability)



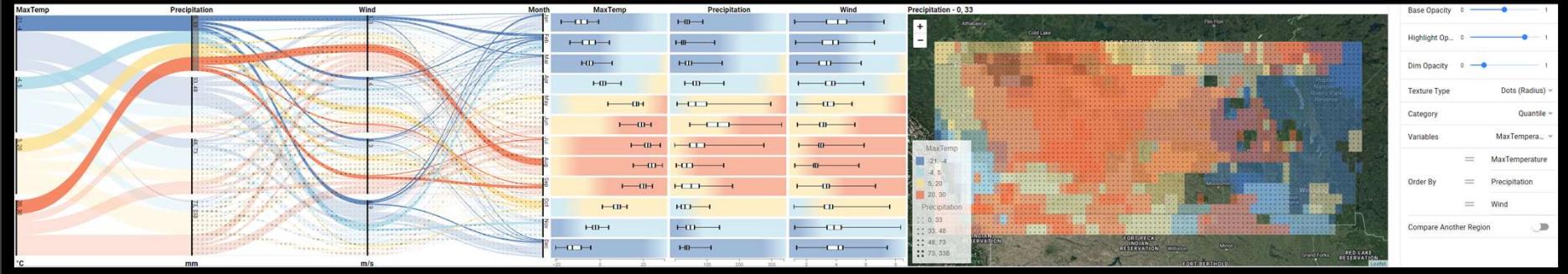
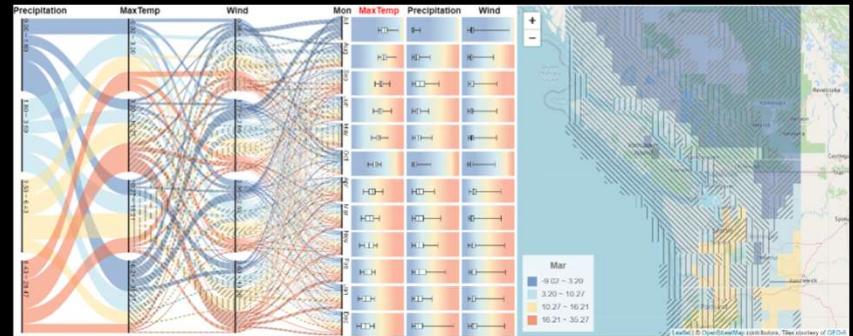
SET-STAT-MAP (Scalability)



Interaction with Domain Experts

We collaborated with the domain experts

- weekly one-hour meetings over three months
- refined the system to be used in a real-life setting
- units for different meteorological variables
- color maps they are comfortable using
- simpler textures such as dotted ones



Interaction with Domain Experts

- Enthusiastic about the prospect of SET-STAT-MAP and using it as a tool to display various standardized hydro-climate indices at once
- Suggested to extend our focus on using SET-STAT-MAP to present and compare the long-term indices, such as Standardized Precipitation Index (SPI) and Soil Moisture Deficit Index (SMDI)
- Integrate SET-STAT-MAP with existing hydrological models so that one can validate the models' prediction outputs against observed data

Summary

- SET-STAT-MAP leverages the idea of multiple coordinated views to visualize mixed data
- The design harmoniously blends a Parallel Sets view, a statistics columns view and a map view to visualize mixed data in a linear fashion
- Our design allows users to explore the pairwise attribute relationships, statistical summaries and trends, and spatiotemporal distribution of various attributes
- We demonstrated the functionality of SET-STAT-MAP using real-life datasets
- We believe our approach to visualizing mixed data will inspire future work in visualization and interface design to explore heterogeneous data