Vermont's Climate Variability and Backward Seasons

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RACC
Research on Adaptation to Climate Change

VERMONT EPSCoR

Backward spring

Credit: L-A. Dupigny-Giroux

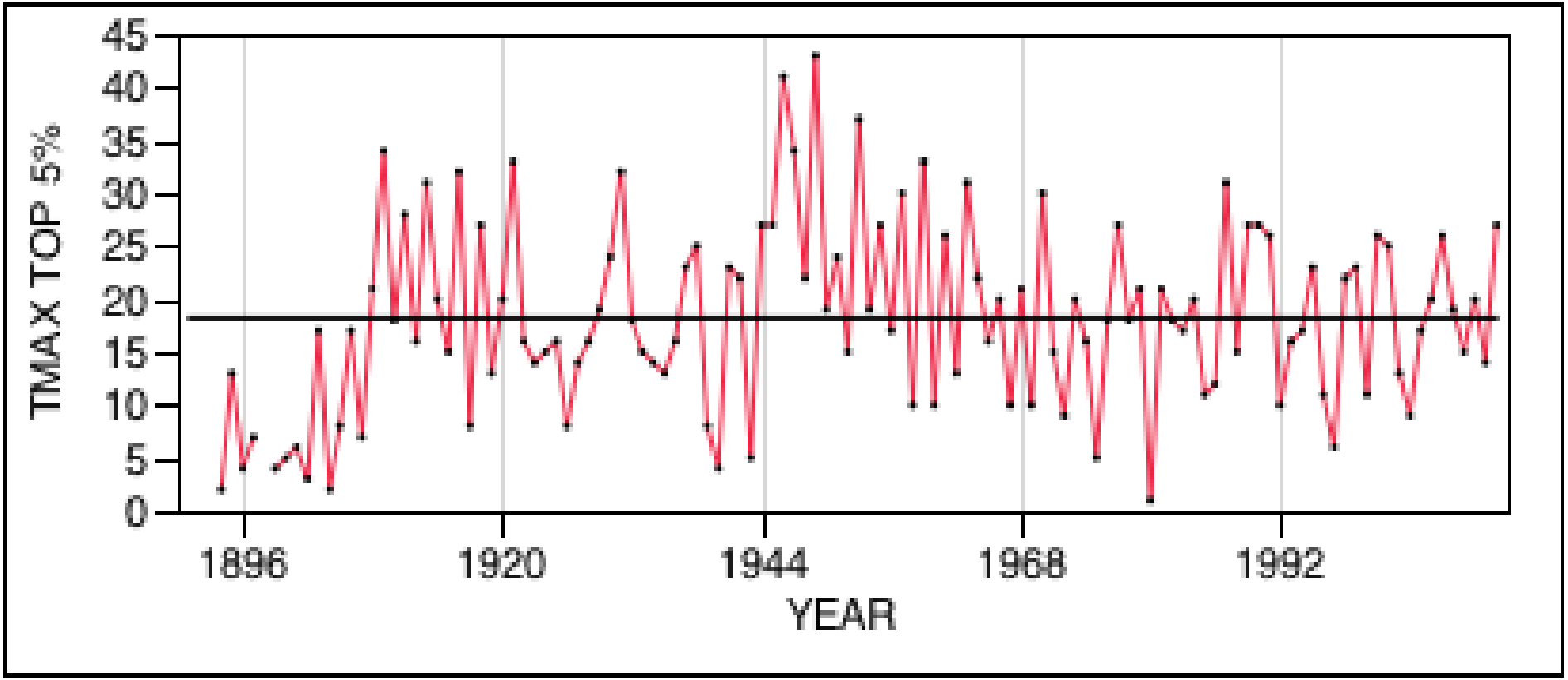
- low temperatures in January – June
- land-locked stations colder
- winter freeze/thaw cycles – predictor
- snow, freezing rain – April to June
- summer killing frosts
- summer drought
- NW flow

Dupigny-Giroux (2009) Backward Seasons, Droughts and Other Bioclimatic Indicators of Variability

Methods

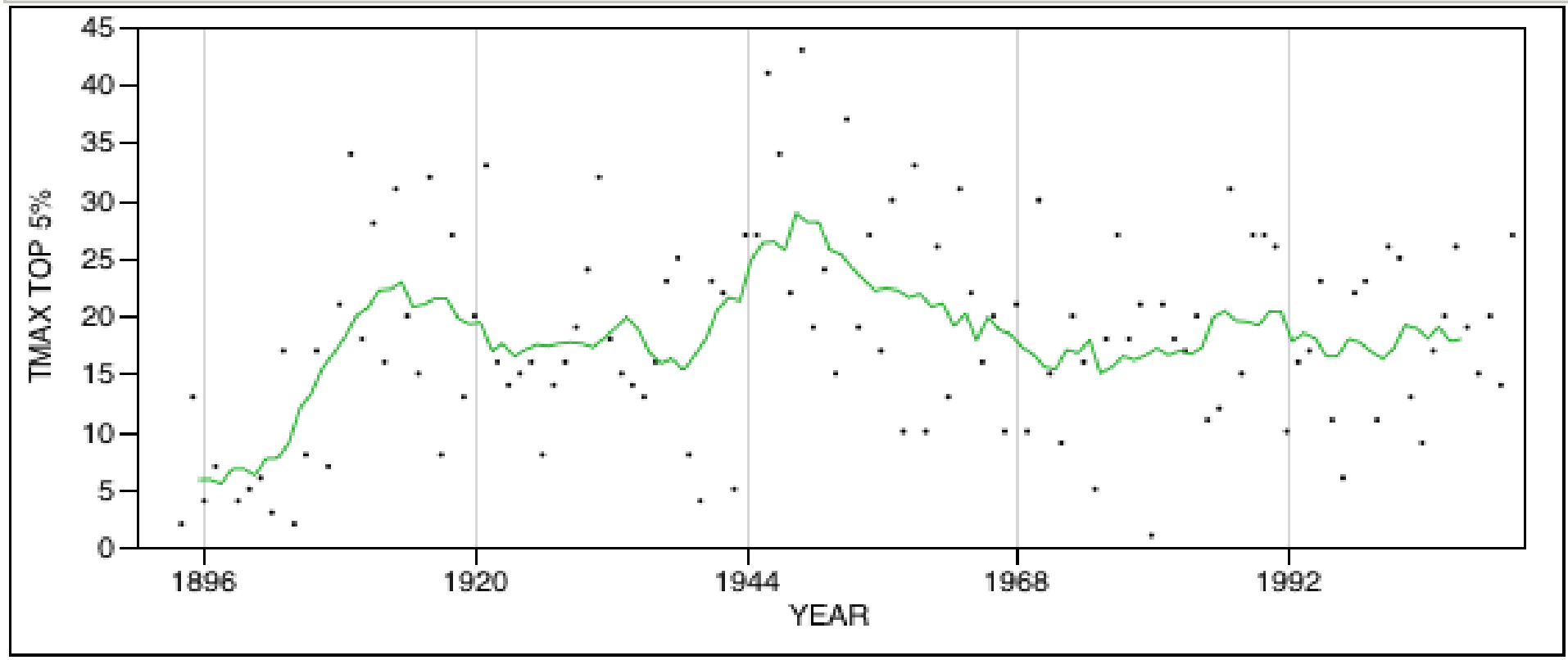
- 19 VT long term stations
- Difference from mean for max and min temperatures over time
- Focused on highest and lowest 5% standardized anomalies for max and min temperatures
- Test for significance using the autocorrelation function and p-values
- Simple Moving Averages

Time Series TMAX TOP 5%

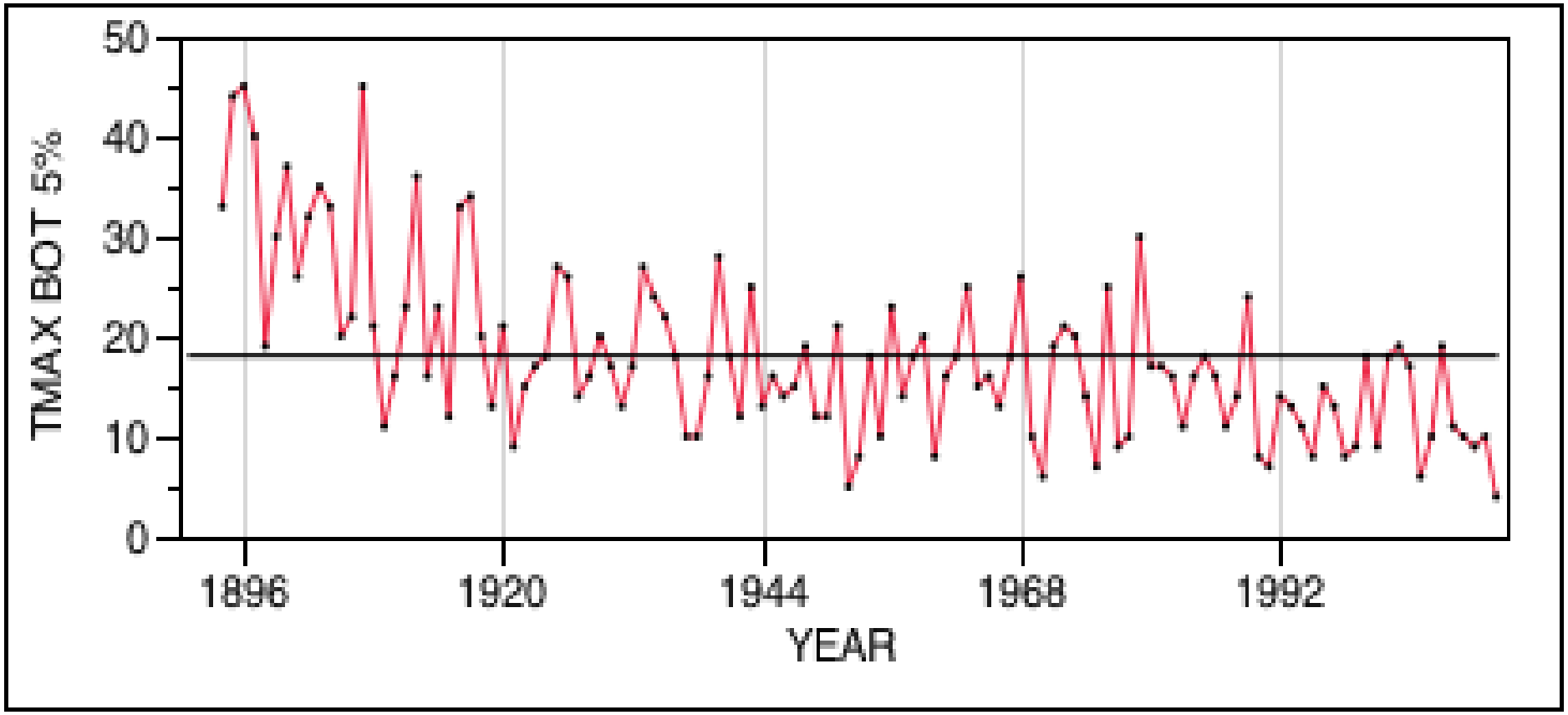


Mean	18.220339
Std	8.7673659
N	118
Zero Mean ADF	-3.073048
Single Mean ADF	-9.916553
Trend ADF	-9.973878

Simple Moving Average (TMAX Top 5%)

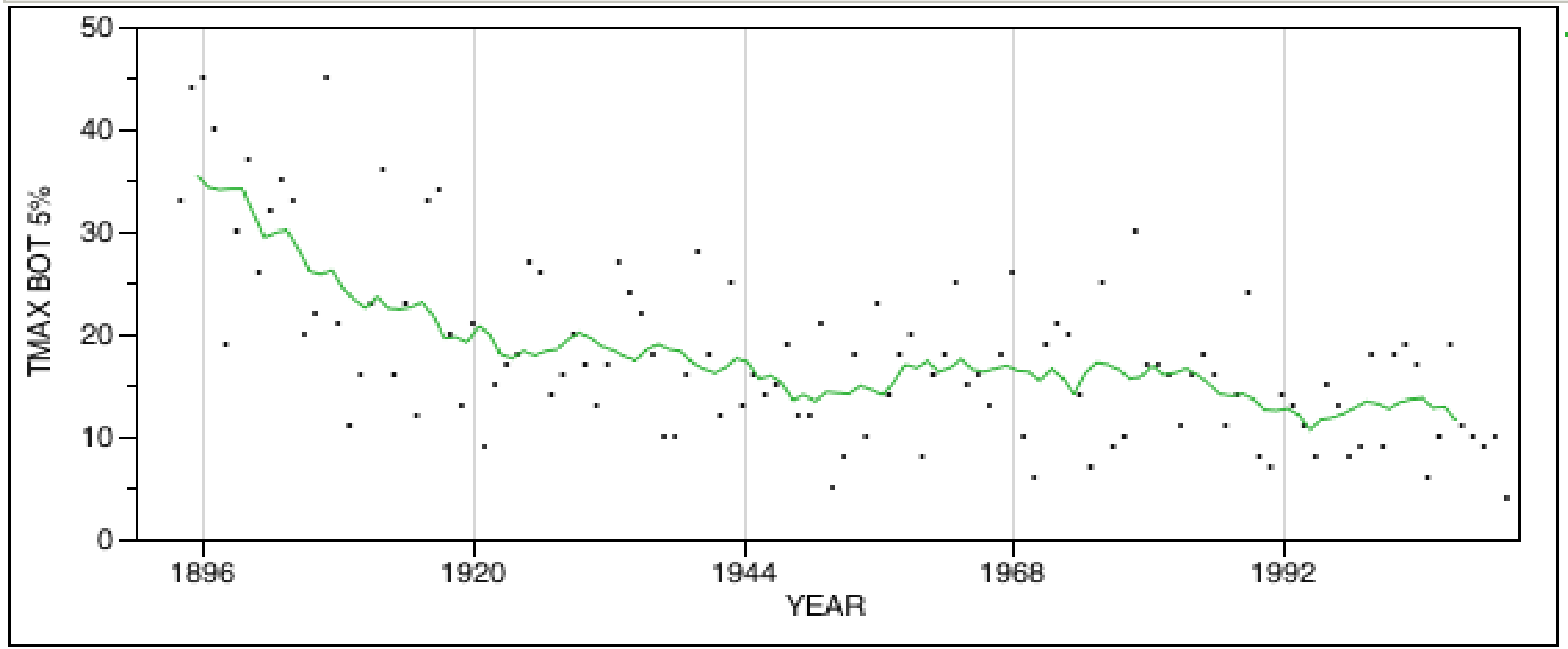


Time Series TMAX BOT 5%



Mean	18.058824
Std	8.6367342
N	119
Zero Mean ADF	-2.752282
Single Mean ADF	-6.549218
Trend ADF	-8.898585

Simple Moving Average (TMAX Bottom 5%)



Conclusion

- At the St. Johnsbury station:
- Significant decreasing over 118 years of the frequency of extreme cold days
- Best fit moving average of 10 years
- Implications for understanding present day climate variability and changes

References

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Acknowledgements

- Lesley-Ann Dupigny-Giroux
- VT EPSCoR, RACC, CWDD
- Funding provided by NSF Grant EPS-1101317