Statistical Methods for Change-Point Detection in Surface Temperature Records

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Seasonality

Reno, NV

Temperature (°C)

J F M A M J J A S O N D

-20 -10 0 10
Seasonality Removed

Reno, NV

Temperature (°C)

1900 1920 1940 1960 1980 2000

−10 −5 0 5
Identifying Changes with Smoothing
Bayesian Approach with Reno

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Summary

- Artifacts in the temperature record affect our ability to estimate rate of change
- Seasonality can mask the artifacts
- Multiple statistical methods available for detecting artifacts after seasonality is removed
  - Smoothing approach is easily automated but less sensitive to changes
  - Bayesian approach is difficult to automate but can be more sensitive to changes