**Looking into The Past?**

### Historic Analysis

- **30-year Moving Average**
  - Example: North Saskatchewan River

### Monitoring and Forecasting

- **Future Projections**
  - Deeply Uncertain

### Paleo-hydrology

- **Reconstructed 30-year Moving Average (based on tree rings)**
  - North Saskatchewan River

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**e.g., 1687-1691** proxy for Precipitation Anomaly

- Headwaters of SaskRB

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**Razavi et al. (2015 WRR)**

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**AGU Publications**

**Water Resources Research**

**RESEARCH ARTICLE**

- Toward understanding nonstationarity in climate and hydrology through tree ring proxy records

  - *Water Resources Research* 51:10802

**Time scale effect and uncertainty in reconstruction of paleo-hydrology**

  - *Water Resources Research* 51:10802

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**Hydrological Processes**


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**Journal of Hydrology**


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**Razavi et al. (2015 WRR)**

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**Contents lists available at ScienceDirect**

- *Journal of Hydrology*

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**Research papers**

- Przeglinka, J., and Pasek, W. 2015
  - *Hydrological Processes*

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Paleo-hydrologic reconstruction of 400 years of past flows at a weekly time step for major rivers of Western Canada

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Abstract. The assumption of stationarity in water resources no longer holds, particularly within the context of future climate change. Plausible scenarios of flows that fluctuate outside the envelope of variability of the gauging data are required to assess the robustness of water resources systems to future conditions. This study presents a novel method of generating weekly-time-step flows based on tree-ring chronology data. Specifically, this method addresses two long-standing challenges with paleo-reconstruction: (1) the typically limited predictive power of tree-ring data at the annual and sub-annual scale, and (2) the inflated short-term persistence in tree-ring time series and improper use of prewhitening. Unlike the conventional approach, this method establishes relationships between tree-ring chronologies...
• A novel method of generating weekly-time-step flows based on tree-ring chronology data.

• Addressed two long-standing challenges with paleo-reconstruction:
  
  (1) the typically limited predictive power of tree-ring data at the annual and sub-annual scale, and

  (2) the inflated short-term persistence in tree-ring time series and improper use of prewhitening.

• An ensemble approach to represent the uncertainty inherent in the statistical relationships and disaggregation method.

• Properly preserved the statistical properties of reference flows, short- to long-term persistence and the structure of variability across time scales.