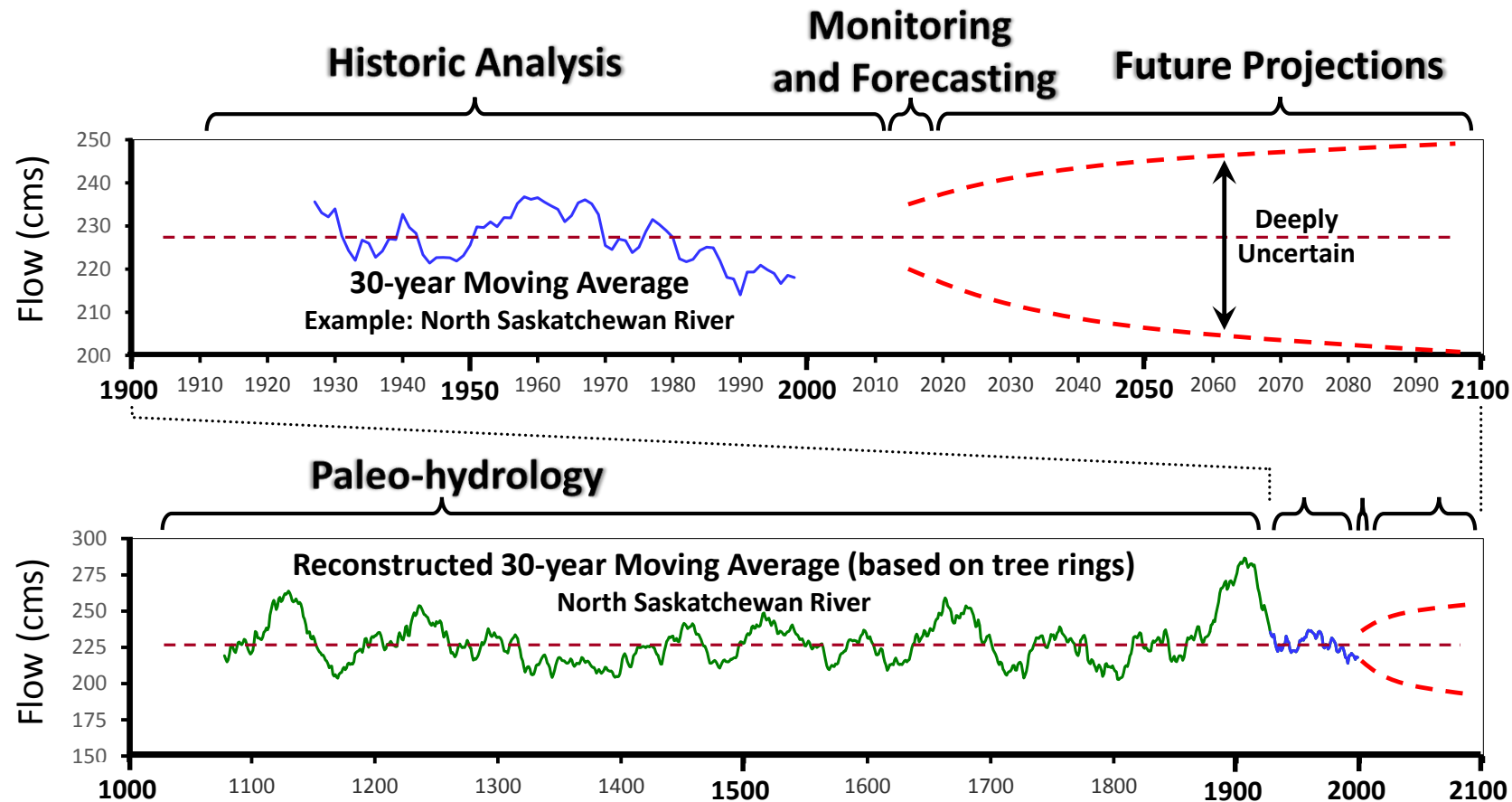
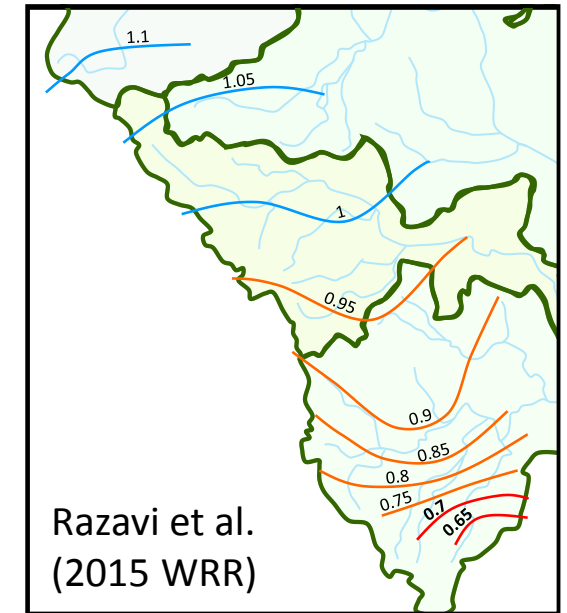


LOOKING INTO THE PAST?



e.g., 1687-1691 proxy for
Precipitation Anomaly
Headwaters of SaskRB



AGU PUBLICATIONS

Water Resources Research

RESEARCH ARTICLE Toward understanding nonstationarity in climate and hydrology through tree ring proxy records
10.1002/2014WR015696

Key Points:

- Significant nonstationarities exist in the mean and autocorrelation structure
- Unlike the mean, autocorrelation changes consistently across space

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HYDROLOGICAL PROCESSES
Hydrol. Process. (2016)
Published online in Wiley Online Library
(wileyonlinelibrary.com) DOI: 10.1002/hyp.10754

Time scale effect and uncertainty in reconstruction of paleo-hydrology

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Research papers

Prewhitening of hydroclimatic time series? Implications for inferred change and variability across time scales

Saman Razavi^{a,*}, Richard Vogel^b

1



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<https://doi.org/10.5194/essd-2019-57>

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Data description paper

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

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Global Institute for Water Security, University of Saskatchewan, Saskatoon, Saskatchewan, Canada

Received: 29 Mar 2019 – Accepted for review: 07 May 2019 – Discussion started: 17 May 2019

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

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Short summary

Water management faces

HIGHLIGHTS

- 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.