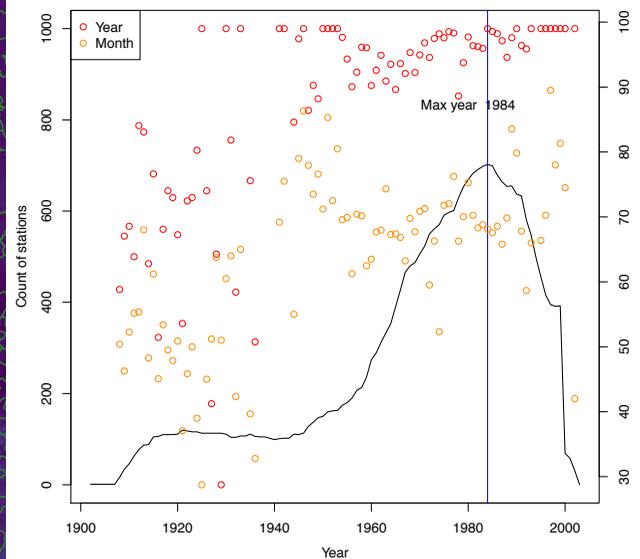
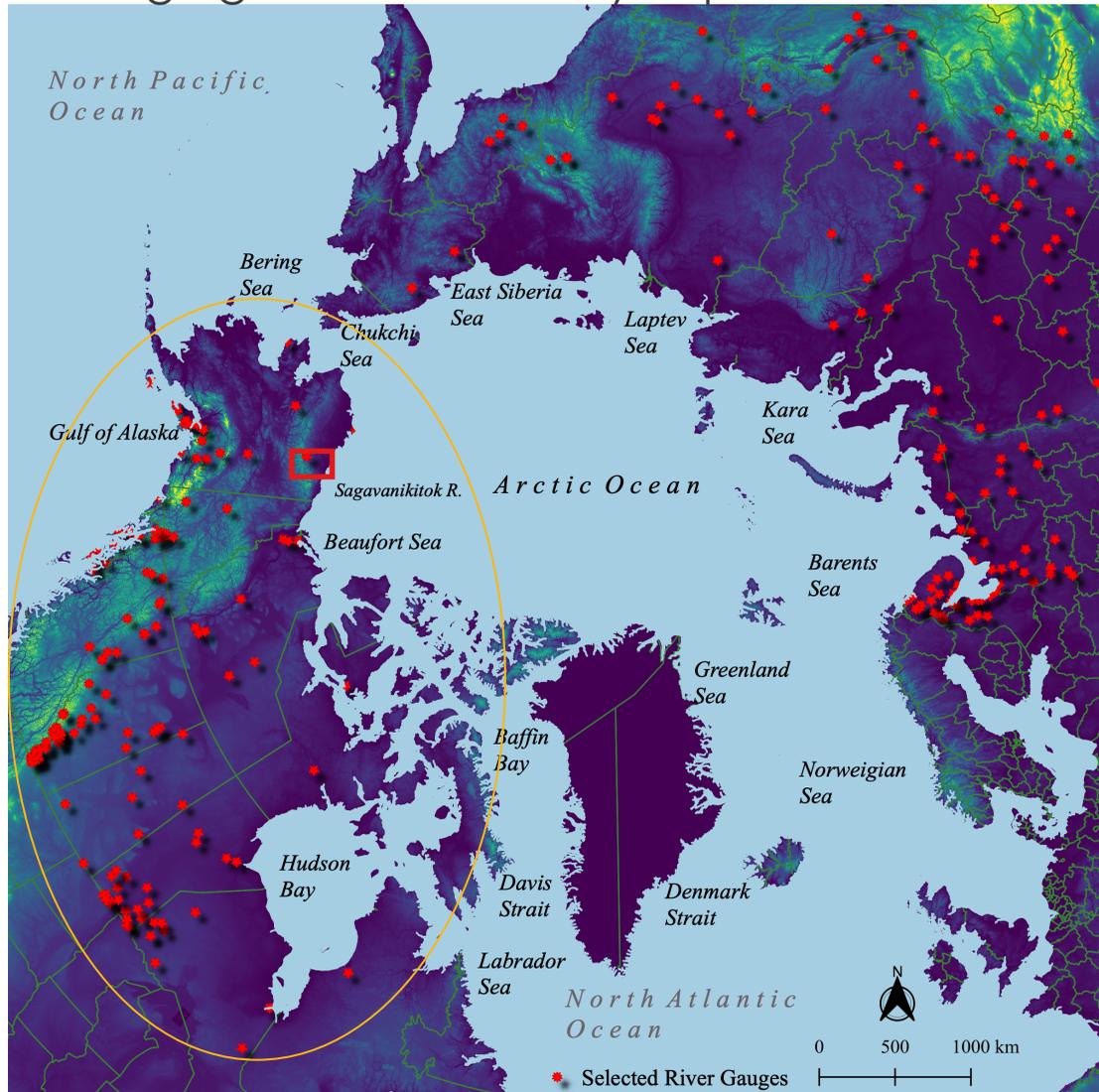


INTERFACE COASTAL – KATRINA E. BENNETT

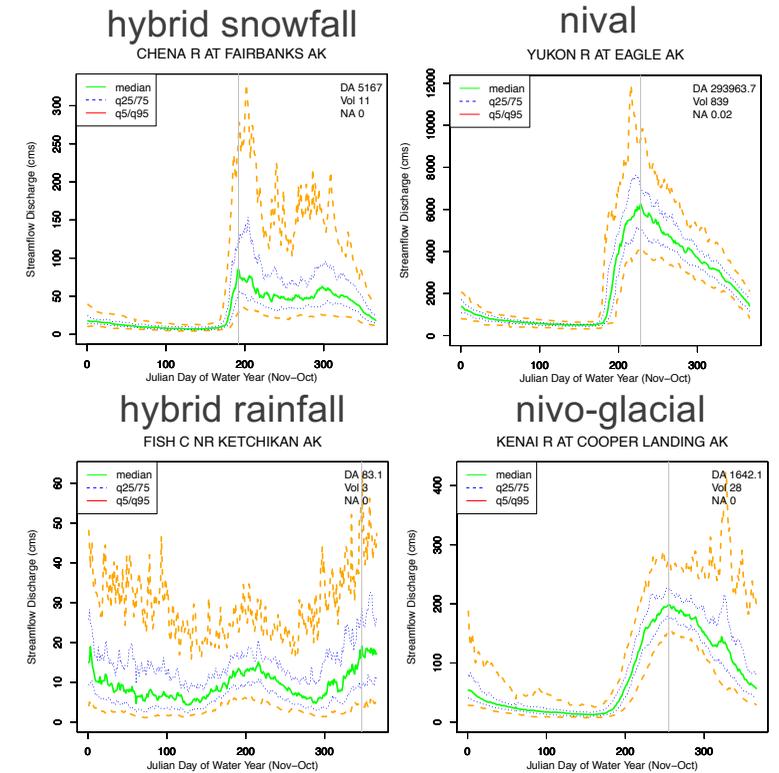
CHANGING SEASONALITY IN NORTH AMERICAN HIGH LATITUDE RIVERS

Changing river seasonality impact the Arctic



Low spatial and temporal extent

High variability



INTERFACE COASTAL BACKGROUND & METHODS

Subset Data

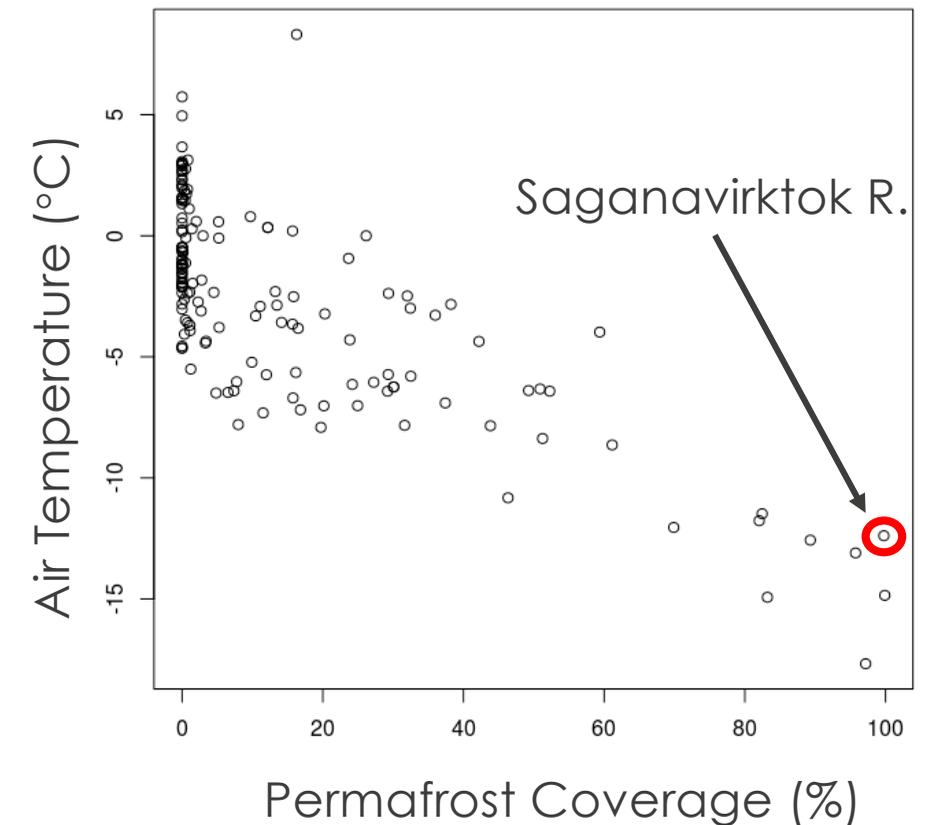
- R-ArcticNet North American rivers (n=2650) year end > 1948 (n=1045)
- Removed stations with $\geq 25\%$ missing (daily) (n= 138)
- Dams, diversions, etc. stations removed (n= 132)
- Years 70 (1948-2019), 50 (1968-2019), 30 (1988-2019) (n= 93)

Calculate Statistics

- Calculate min, max, mean, variance monthly data, annual statistics e.g. day of peak streamflow, peak magnitude
- Other metrics, climate, basin area, glacier, ecoregion (Rabpro)

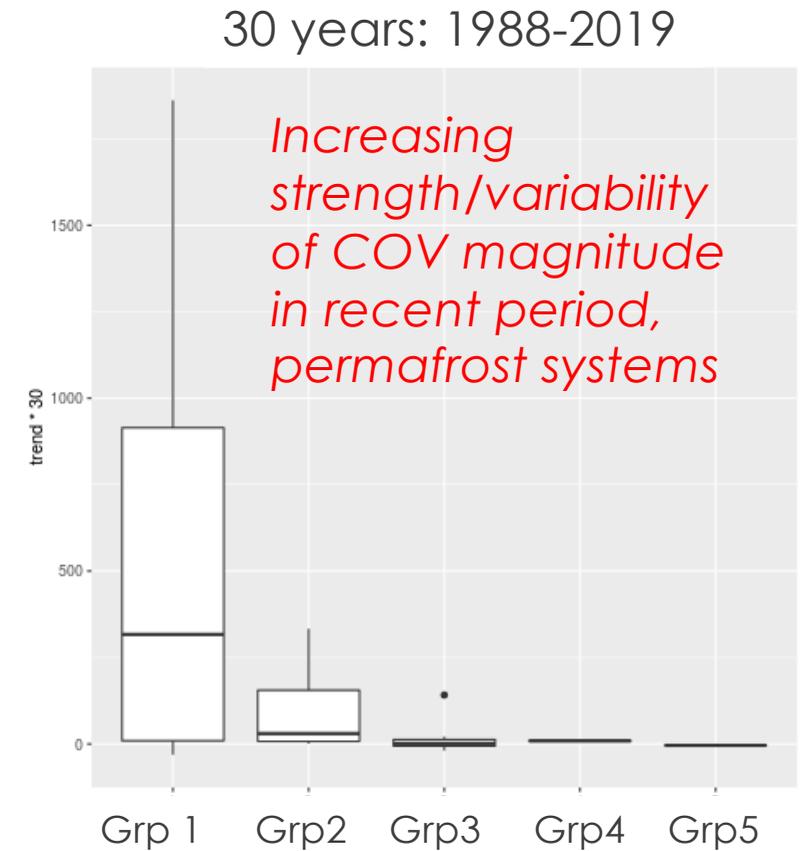
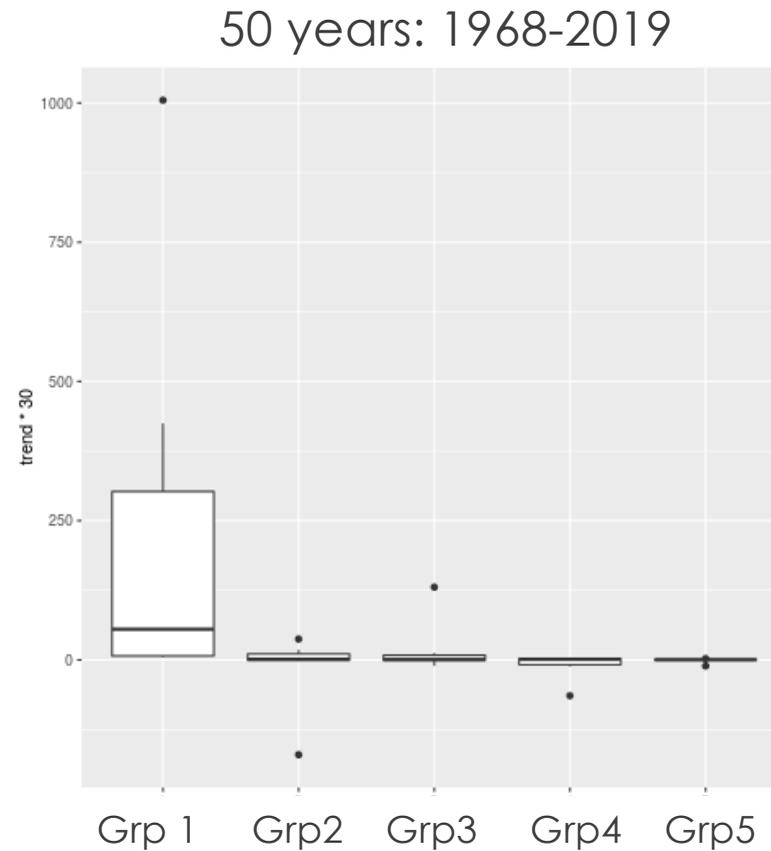
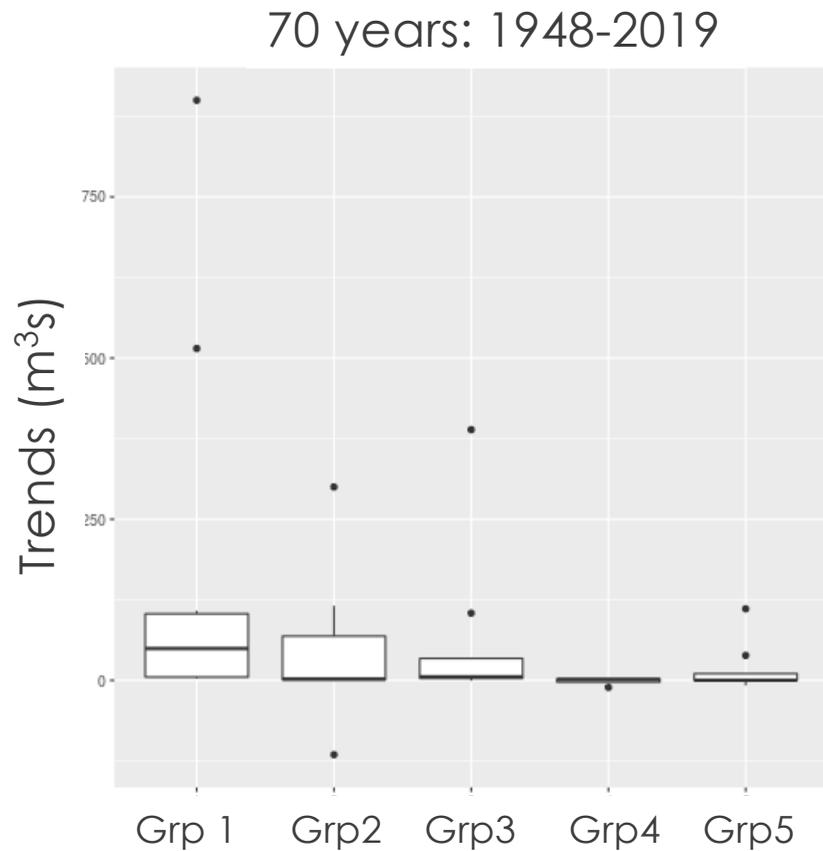
Trends and Classification

- Calculate trends magnitude Theil-Sen, trend significance Mann-Kendal (zyp.R)
- Permafrost and air temperature relationship to classify
- Five evenly sized groups selected (18/19 rivers in each class)



INTERFACE COASTAL RESULTS

Permafrost systems have a larger range/stronger in COV magnitudes versus non-permafrost systems



decreasing permafrost/
increasing temperature

Magnitude of Center of Melt (COV)

grp1=-5.5 C, grp5=8.6 C

Overcome low spatial and temporal extent and high variability in observations

- QA/QC to ensure records are high quality
- Develop novel methods to address issues at specific stations
- Use novel tools (e.g. Rabpro) to develop metadata about the rivers for meaningful classification

Calculate trends for use in E3SM validation

- Identify major patterns of trends and key metrics
- Apply trend results to validate E3SM output
- Develop ILAMB tools for key metrics
- Use ILAMB to determine the range of responses across models ensembles for comparison with E3SM

Consider social impacts, expand to Eurasian Arctic

- Collaborations within InterFACE, IT2 social impacts of changing river trends
- Collaborations outside InterFACE, e.g. HILAT, University of Colorado Boulder, Environment Canada

“Bennett et al. 2021 in prep. Changing Seasonality of North American Arctic River Discharge”