

Pacific Oceanic / Atmospheric Variability and the Wind River Range

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Abstract. A study of the influence of interdecadal and interannual Pacific oceanic / atmospheric variability on the Wind River Range (WRR), Wyoming is presented. The WRR is an unbroken 160-kilometer barrier that is host to 63 glaciers, the largest concentration of glaciers in the American Rocky Mountains. Glacial recession over the past half century has resulted in an increased interest in the region. Instrumental datasets were obtained for unimpaired streamflow and snow water equivalent for stations in the Green River Basin (GRB – west slope of WRR) and the Wind-Bighorn River Basin (WBRB – east slope of WRR). The phases (cold or warm) of Pacific [El Niño-Southern Oscillation (ENSO) and Pacific Decadal Oscillation (PDO)] oceanic / atmospheric phenomena were identified. Statistical significance testing of the datasets, based on the interdecadal and interannual oceanic / atmospheric phase (warm or cold), was performed applying the parametric t-test test. The results show that the interannual ENSO phase influences streamflow and snow variability in the WRR and the interdecadal PDO phase influences snow variability during La Niña events.