

# Appendix A: Stationarity Tests

TABLE A1. EXAMPLES OF TESTS FOR THE FIRST MOMENT.

Test	Time series is stationary when...	Examples	Whole or split time series?	Trend or change point?	Notes
<b>T-test on linear trendline*</b>	Non-significant slope (slope ~ 0)	Cooper (2002)	Whole	Trend (monotonic)	Sensitive to outliers; can also perform trend test on other time series, such as variance
<b>Quantile regression trend</b>	Non-significant slope (slope ~ 0)	Luce and Holden (2009)	Whole	Trend (monotonic)	Can assess different parts of flow distribution; more robust to outliers than ordinary least squares; can also perform on variance
<b>T-test of means*</b>	Means of two groups not significantly different	Murphy and Ellis (2014)	Split	(reflects split)	Robust to skew given sufficient sample sizes
<b>Mann-Kendall trend test on means</b>	No tendency for the sign of differences between points to be positive or negative	Miao et al. (2012); Liu et al. (2013); Murphy and Ellis (2014); Asarian and Walker (2016); Wang et al. (2021); Yang et al. (2021)	Whole	Trend (monotonic)	Widely used; robust to outliers; null hypothesis is wrong for hydrologic series with long-term persistence
<b>Pettitt test</b>	Non-significant difference between the sums of pre-point versus post-point sign differences between consecutive points (change point is the split with the maximum difference)	Miao et al. (2012); Liu et al. (2013); Kazemzadeh and Malekian (2018); Ryberg et al. (2020); Wang et al. (2021)	Whole	Change point (single)	Widely used; good false positive rate; does not strictly assume serial independence
<b>Standard normal homogeneity test*</b>	Maximum difference in means from splitting series at each point is small	Kazemzadeh and Malekian (2018); Pandžić et al. (2020)	Whole	Change point (single)	Bias to detecting change points near middle of time series
<b>von Neumann ratio test</b>	Ratio of mean square consecutive difference to the variance is ~2	Kazemzadeh and Malekian (2018)	Whole	Autocorrelation	Only checks lag-1 (consecutive values)
<b>Buishand range test*</b>	Range of the cumulative sum of differences from the mean is fairly small	Kazemzadeh and Malekian (2018)	Whole	Change point (single)	May be sensitive to outliers

<b>Cumulative deviation test (CUSUM)</b>	Cumulative sum of differences from mean oscillates about zero within 4-5 standard deviations	Tao et al. (2011); Kazemzadeh and Malekian (2018)	Whole	Change point (multiple)	Subjective threshold selection
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TABLE A2. EXAMPLES OF TESTS FOR THE SECOND MOMENT.

Test	Time series is stationary when...	Examples	Whole or split time series?	Notes
<b>F-test*</b>	Ratio of two samples' variances is non-significant (ratio ~ 1)	Murphy and Ellis (2014)	Split	Sensitive to non-normality; need to define split
<b>Mann-Kendall trend test on variances</b>	No tendency for the sign of differences between points to be positive or negative	Rice et al. (2015)	Whole	Widely used; robust to outliers; null hypothesis is wrong for hydrologic series with long-term persistence
<b>Autocorrelation</b>	Non-significant autocorrelation (correlation ~ 0) at relevant lags	Liu et al. (2013); Murphy and Ellis (2014); Yang et al. (2021); Wang and Yang (2024)	Whole	Indirect assessment; of higher order moment stationarity; need to identify relevant lags, but lag-1 is common
<b>Levene test</b>	Means of absolute differences from central tendency are not significantly different (ANOVA) between groups	Murphy and Ellis (2014)	Split	Handles heavily tailed and skewed variables well; need to define split
<b>Engle's ARCH test</b>	Variance of autoregression residuals is constant and does not depend on past residuals	Modarres et al. (2013)	Whole	Somewhat complex (fitting a model to another's residuals); mostly used in economics/finance; inherently addresses any serial dependence

## Appendix B: Climate Change Studies

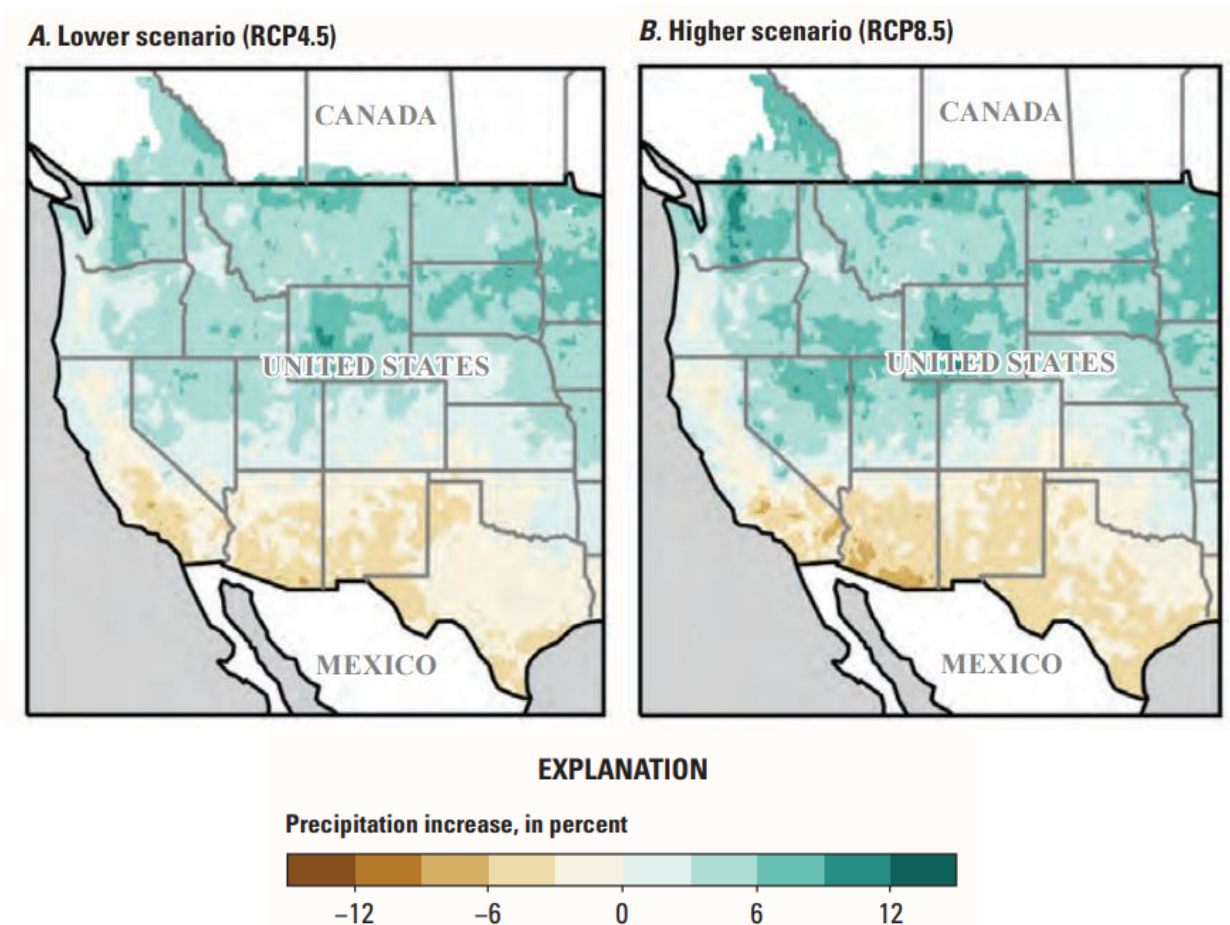


Figure B1. Map as reprinted from Gangopadhyay and McGuire (2021) by Stets et al. (2025) (doi: 10.3133/pp20251894A): “Projected change in precipitation in Western United States during 2040–69 compared with baseline reference period of 1970–99 under (A) lower (Representative Concentration Pathway [RCP4.5]) and (B) higher (RCP8.5) climate-change scenarios. Projections represent an average across 32 separate simulations.”

**SIMULATIONS.”**

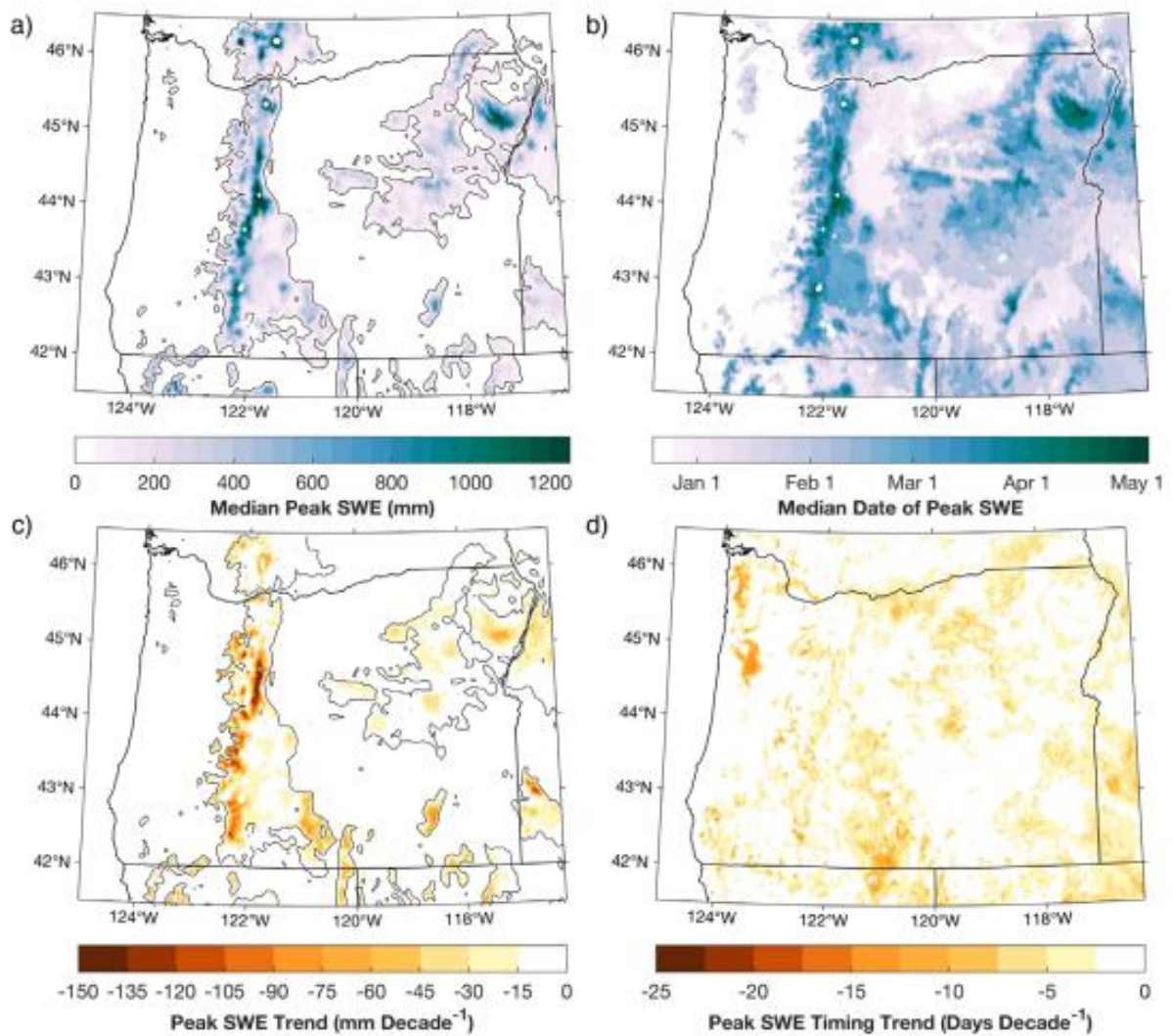


Figure B2. From Dalton and Fleishman (2021): “Oregon snowpack characteristics and trends analyzed over the period 1982– 2017. (a) Median peak snow water equivalent (SWE; mm) and (b) timing of peak SWE (days past 1 October). (c–d) As in (a–b) but illustrating decadal trends (none statistically significant at  $p < 0.001$ ). Trends were assessed with nonparametric Mann-Kendall tests with lag-1 autocorrelation removed (Hamed and Rao 1998). Black contour lines in (a) and (c) enclose areas exceeding 2 inches (50 mm) median peak SWE.”

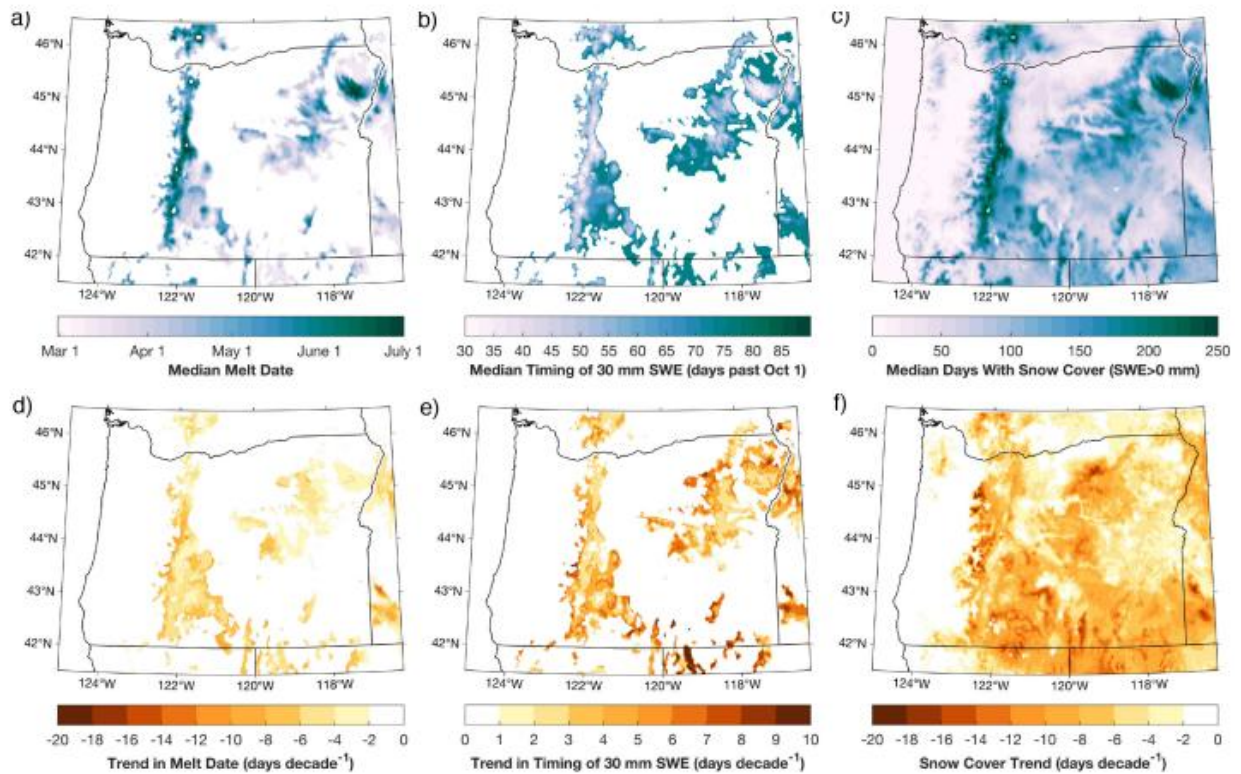


Figure B3. From Dalton and Fleishman (2021): “Additional Oregon snowpack characteristics and trends analyzed over the period 1982–2017. (a) Median timing of melt date, (b) median timing of sufficient snow for recreation (1.2 inches [30 mm] snow water equivalent [SWE]; days past 1 October), (c) median days with snow cover (SWE>0); (d–f) As in (a–c) but illustrating decadal trends. Trends were assessed with nonparametric Mann-Kendall tests with lag-1 autocorrelation removed (Hamed and Rao 1998).”

## Appendix C: Streamflow Stationarity Studies

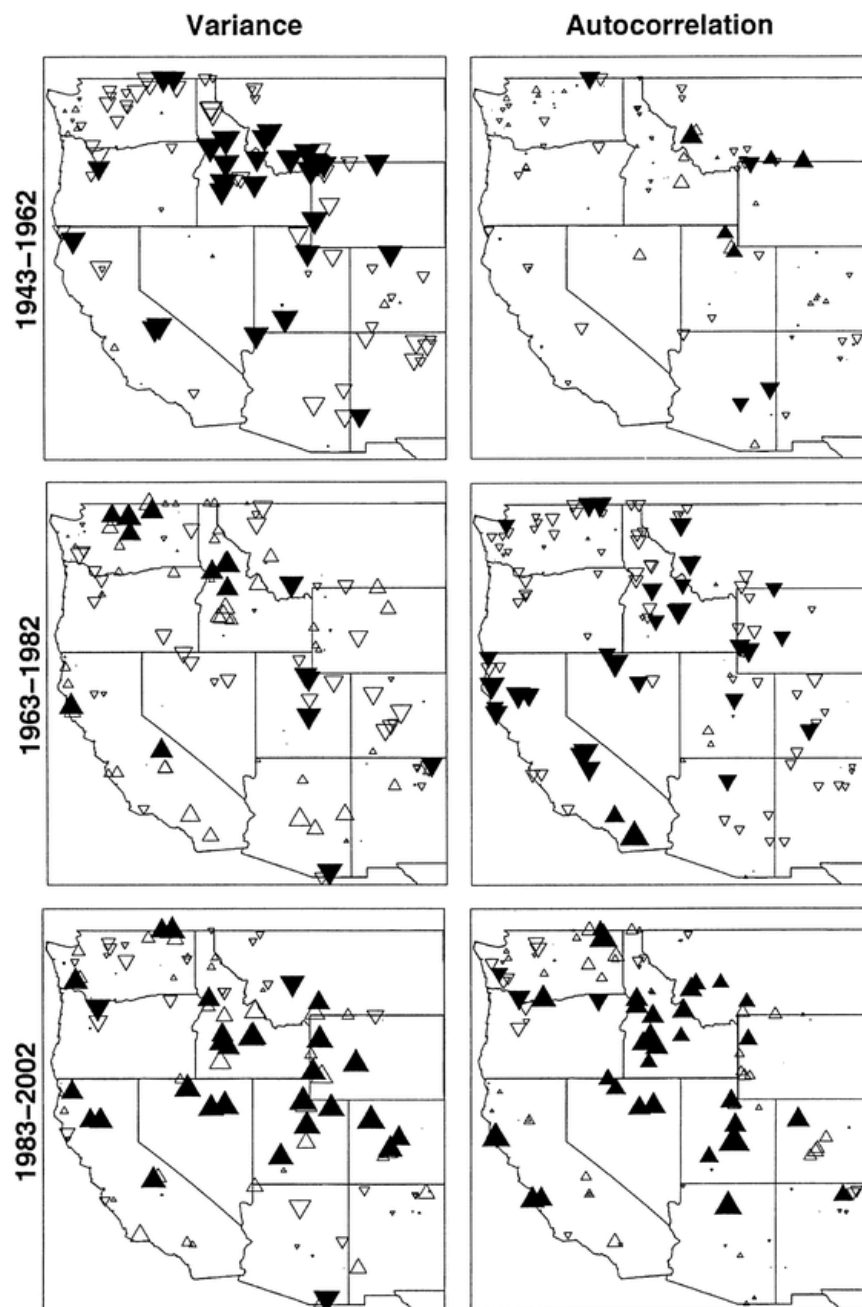


Figure C1. From Pagano and Garen (2005): “Maps of streamflow (left) variance ratio significance and (right) autocorrelation for three 20-yr epochs (top, middle, and bottom). Upward pointing triangles indicate positive autocorrelation or increased variance relative to the period of record. Downward pointing triangles indicate negative autocorrelation or decreased variance. Filled symbols indicate autocorrelation greater/less than  $\pm 0.3$  or statistically significant variance departures. The size of the symbol is proportional to the magnitude of the departure.”

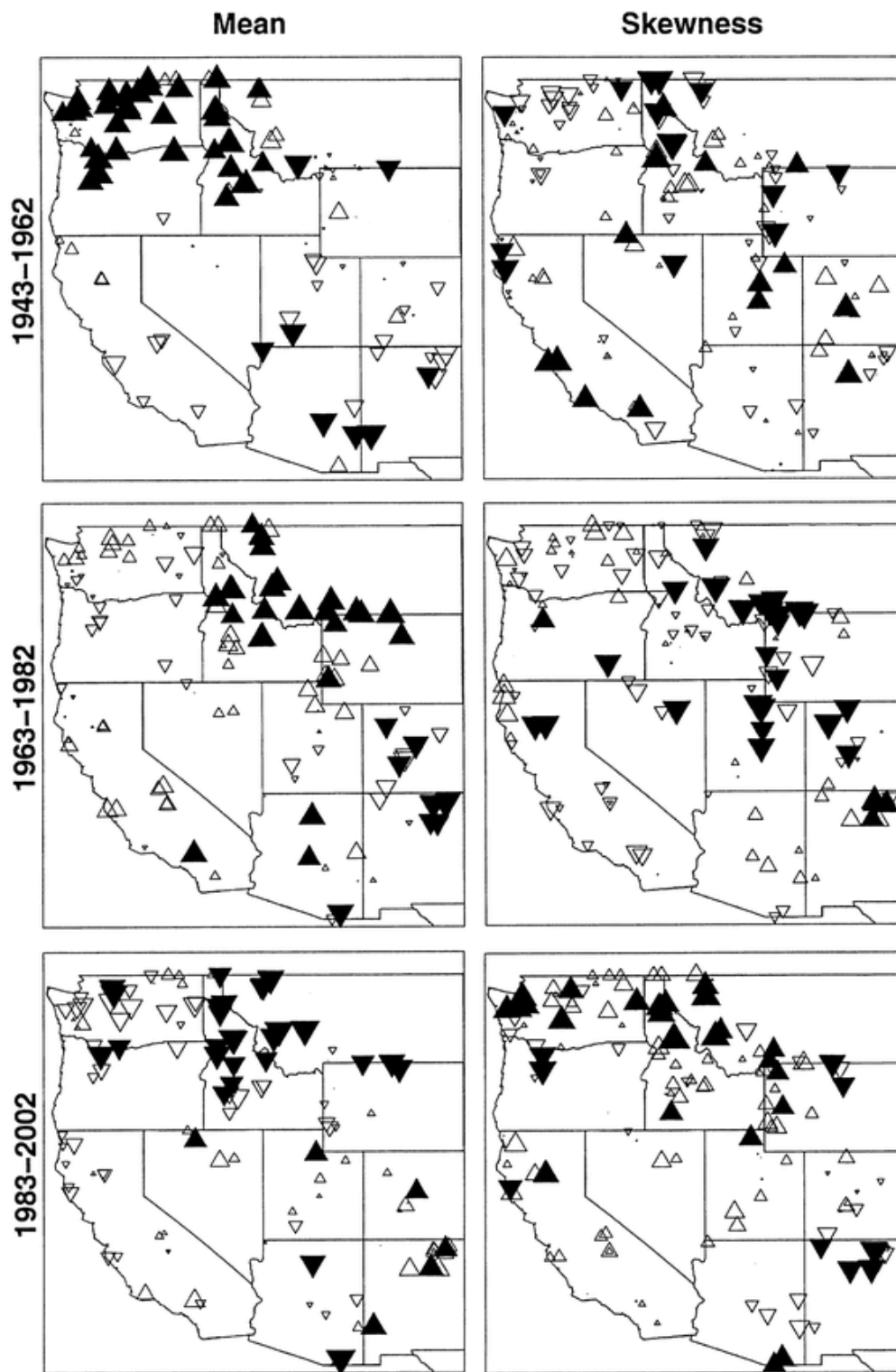


Figure C2. From Pagano and Garen (2005): “As in [previous figure] but for the (left) mean significance and (right) skewness significance. See [previous figure] for symbol definitions.”

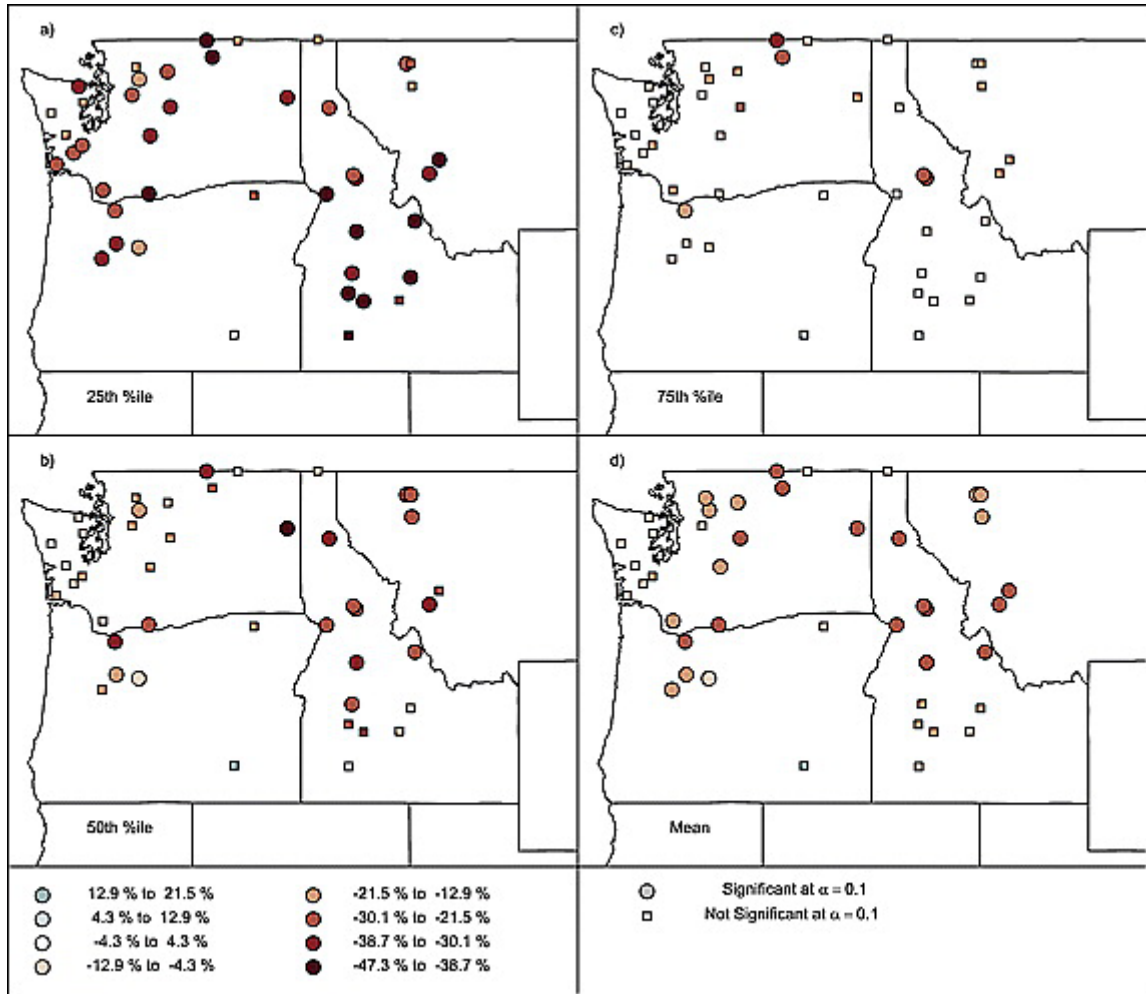


Figure C3. From Luce and Holden (2009): “Maps of changes to (a) 25th percentile annual flow, (b) 50th percentile annual flow, (c) 75th percentile annual flow, and (d) mean annual flow across HCDN stations in the Pacific Northwest 1948–2006.”

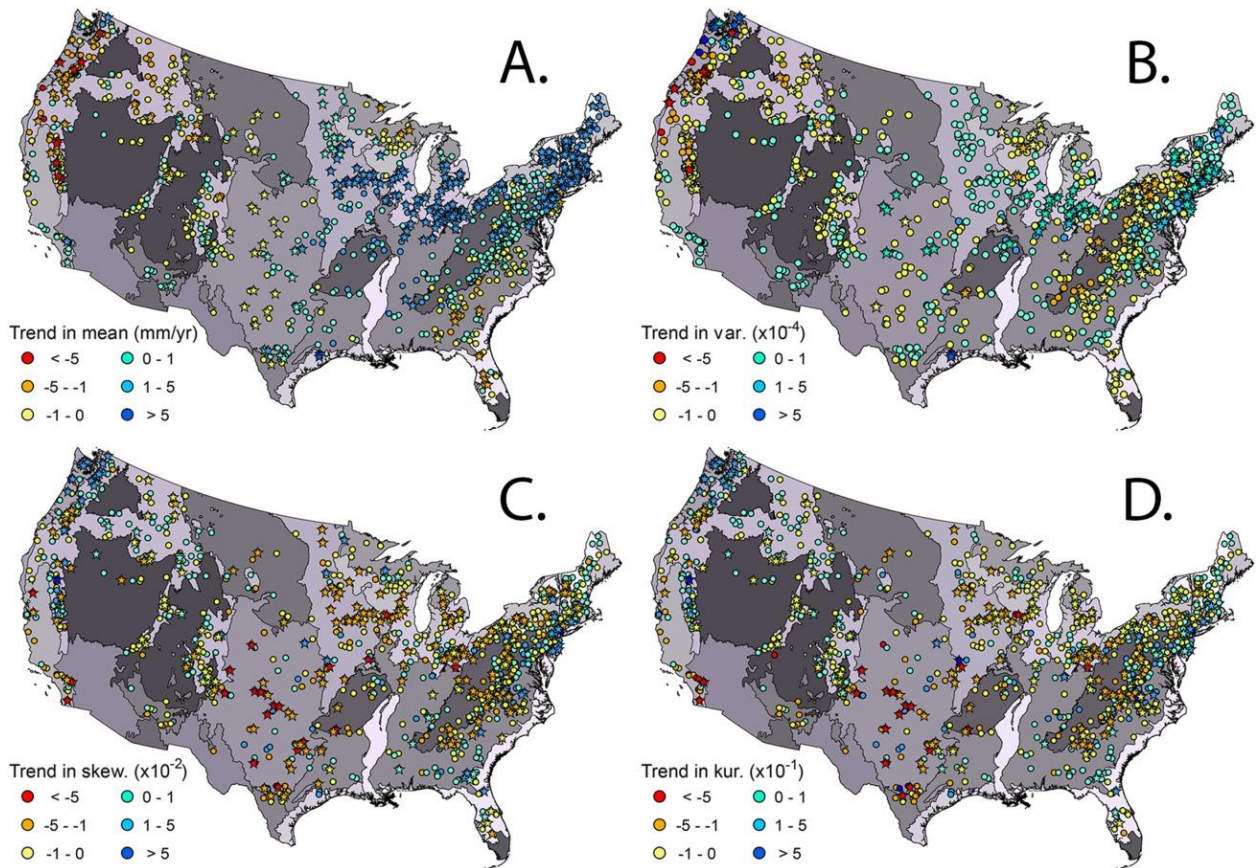


Figure C4. From Rice et al. (2015): “The estimated magnitude of trends in the (a) mean, (b) variance, (c) skewness, and (d) kurtosis of annual streamflow (1940–2009). Warm marker colors (yellow, orange, and red) indicate watersheds with decreasing trends and cool marker colors (light green and shades of blue) indicate watersheds with increasing trends. Markers in the shape of a star indicate trends determined to be statistically significant ( $p < 0.05$ ) via the MK test.”

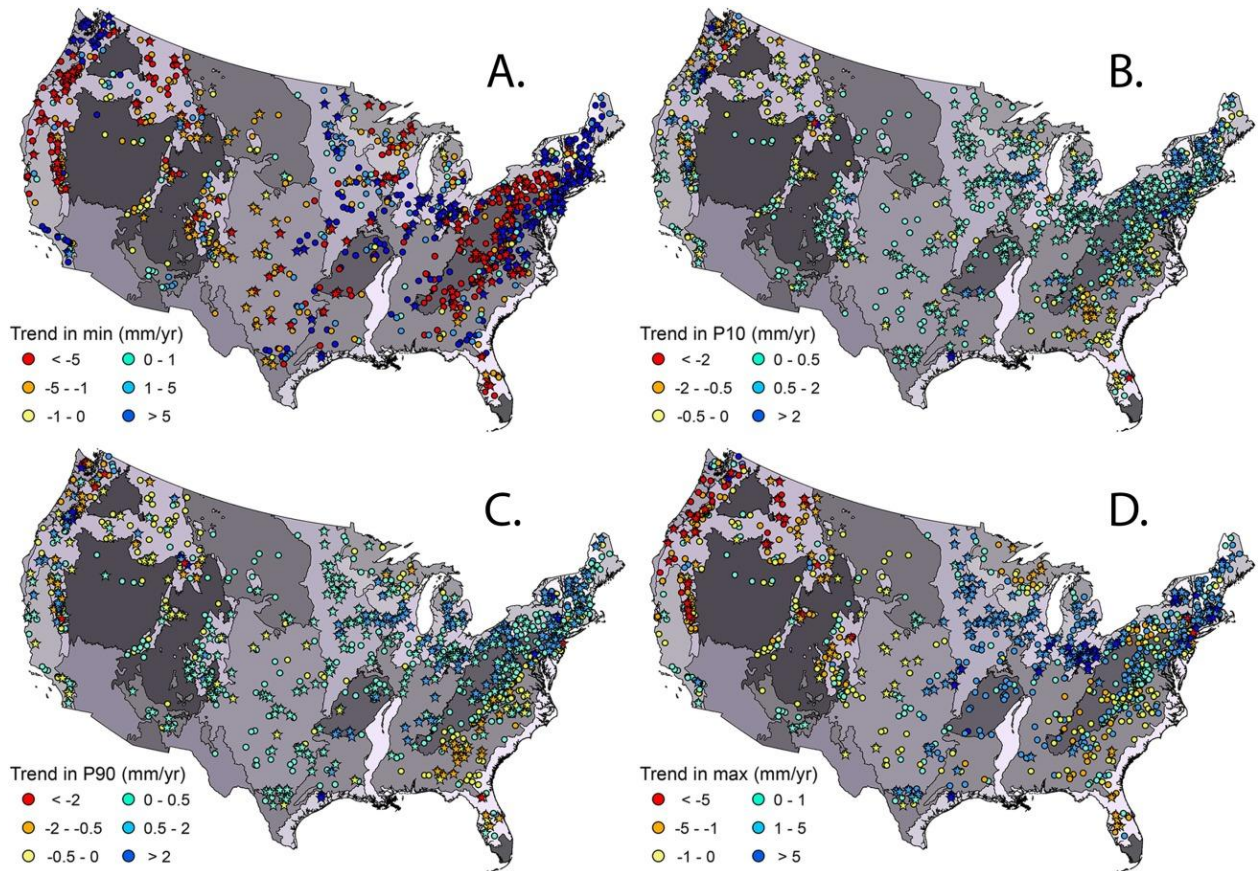


Figure C5. From Rice et al. (2015): “The estimated magnitude of trends in the (a) minimum, (b) tenth percentile, (c) ninetieth percentile, and (d) maximum of annual streamflow (1940–2009). Warm marker colors (yellow, orange, and red) indicate watersheds with decreasing trends and cool marker colors (light green and shades of blue) indicate watersheds with increasing trends. Markers in the shape of a star indicate trends determined to be statistically significant ( $p < 0.05$ ) via the MK test.”

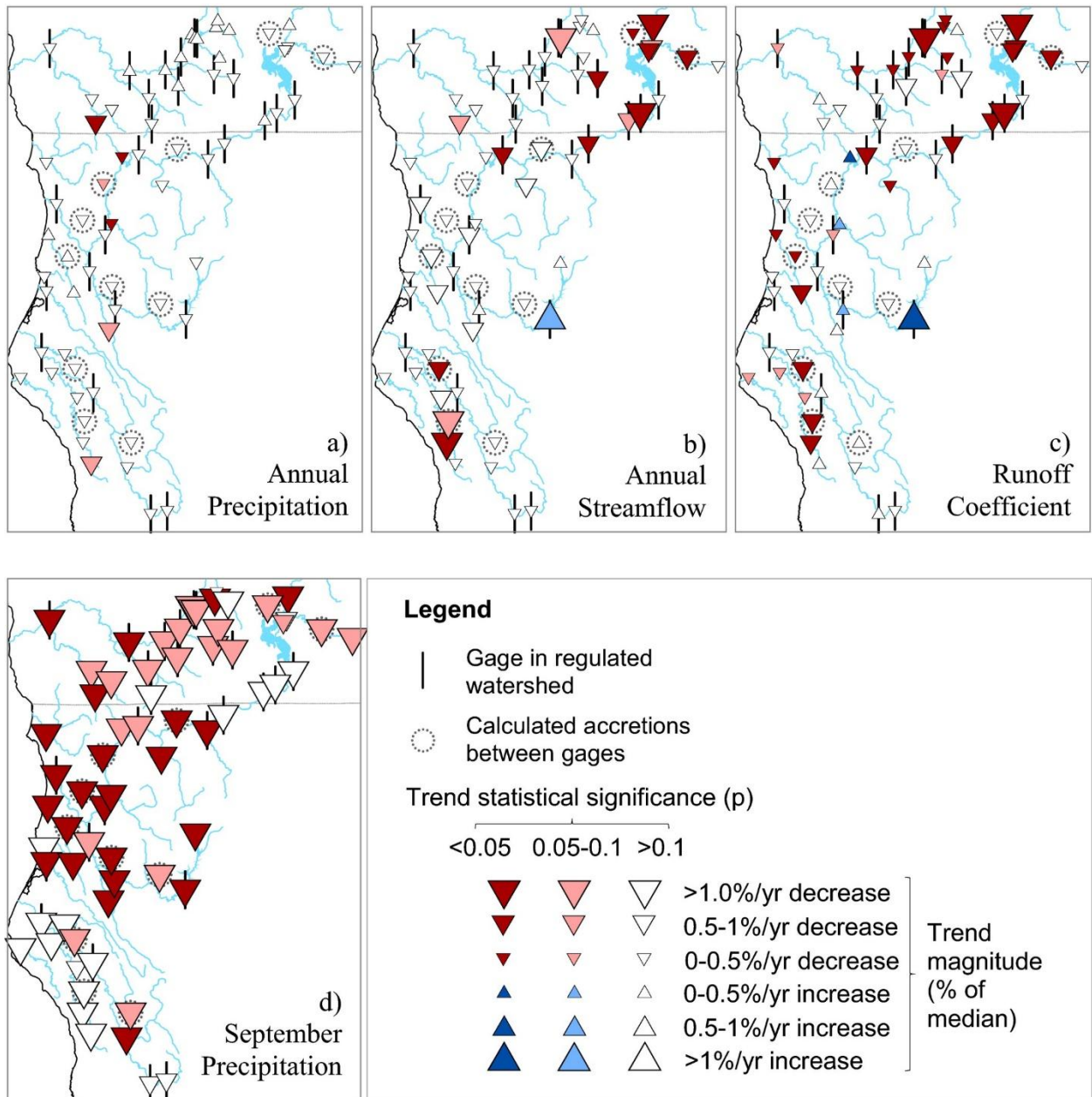


Figure C6. From Asarian and Walker (2016): “Map Showing Trends in (a) Annual Precipitation, (b) Annual Streamflow, (c) Runoff Coefficient, and (d) September Precipitation for Catchments Contributing to Streamflow Sites, 1953-2012.”

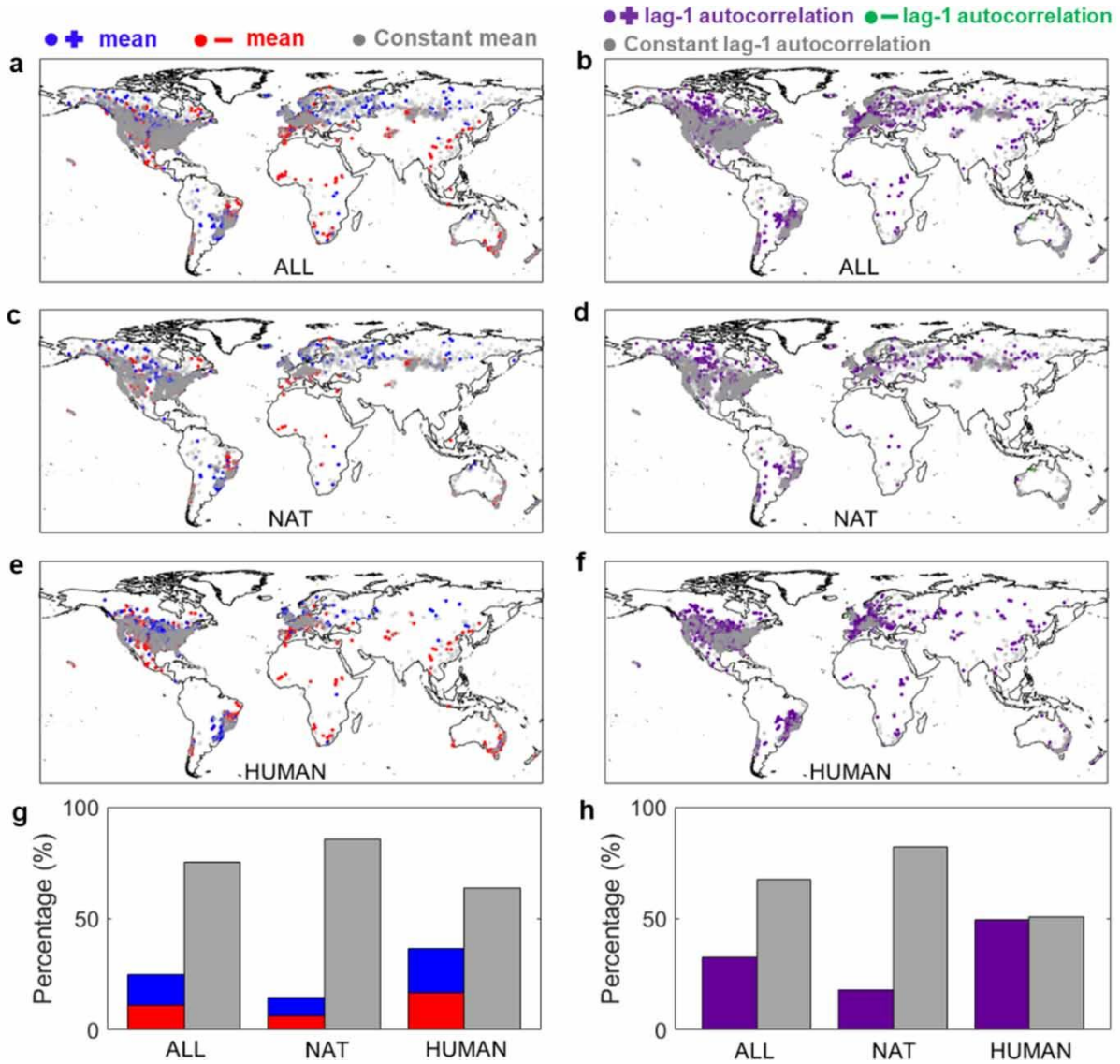


Figure C7. From Yang et al. (2021): “Trend and lag-1 autocorrelation in annual Q time series. Spatial distribution of (a) trend and (b) lag-1 autocorrelation in annual Q time series for all catchments (ALL). Spatial distribution of (c) trend and (d) lag-1 autocorrelation in annual Q time series for natural catchments (NAT). Spatial distribution of (e) trend and (f) lag-1 autocorrelation in annual Q time series for catchments with direct human intervention (HUMAN). Summary of catchments showing percentages for (g) different trends, and (h) lag-1 autocorrelation in annual Q time series. Note that a negative significant lag-1 autocorrelation is detected in very few catchments and is thus not visible in (h).”

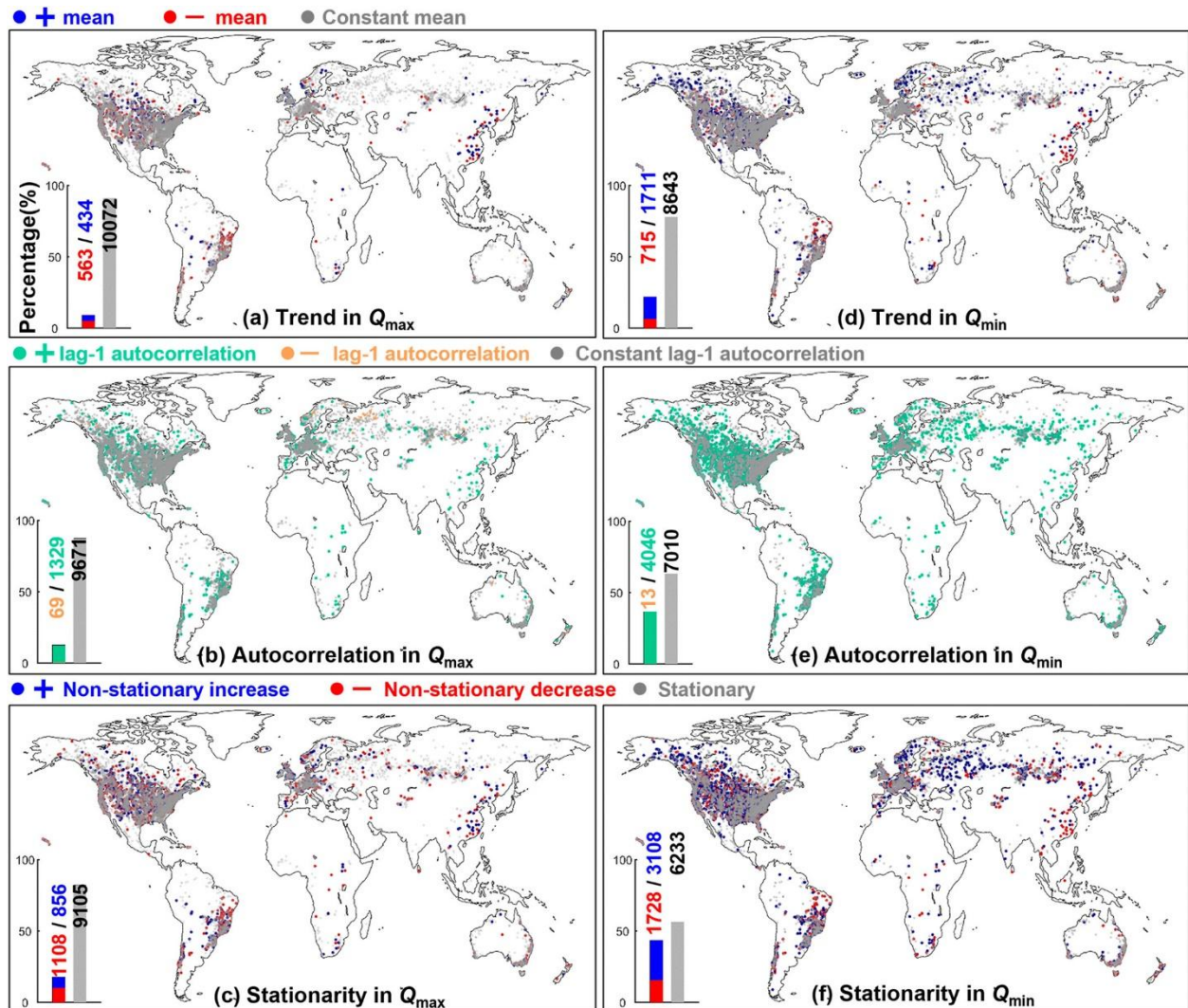


Figure C8. From Wang and Yang (2024): “Trends, lag-1 autocorrelation and stationarity in annual  $Q_{max}$  and  $Q_{min}$  series across the 11,069 global catchments. Spatial distributions of (a) trend, (b) lag-1 autocorrelation and (c) stationarity in annual  $Q_{max}$  series across the 11,069 global catchments. Corresponding maps illustrating (d) trends, (e) lag-1 autocorrelation, and (f) stationarity in annual  $Q_{min}$  series across the same set of 11,069 global catchments. Insets in each map exhibit bars representing the percentage of catchments, with the numerical values above the bars indicating the count of catchments falling into each category.”

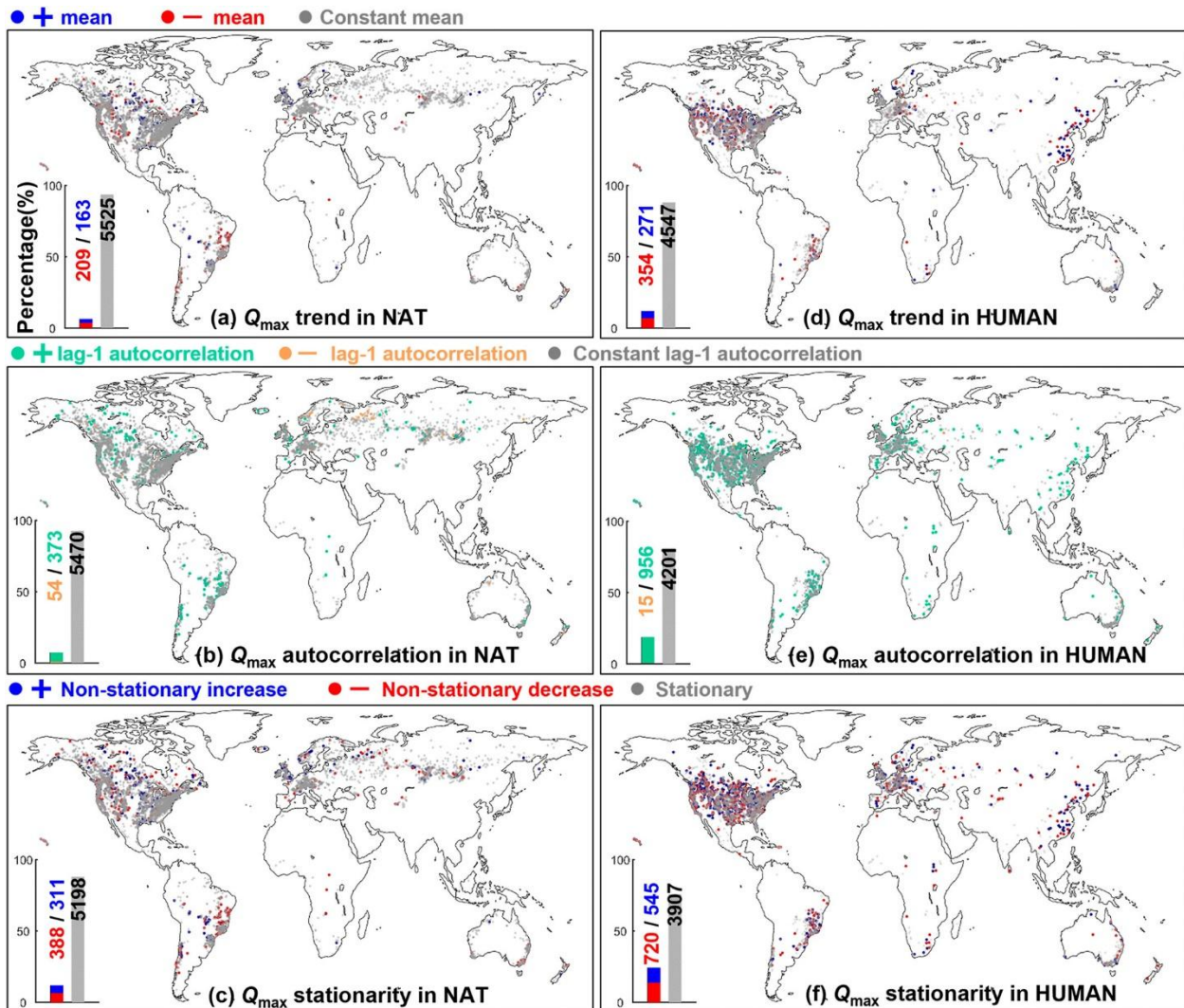


Figure C9. From Wang and Yang (2024): “Trends, lag-1 autocorrelation and stationarity in annual  $Q_{max}$  series for natural and human-impacted catchments. Spatial distributions of (a) trend, (b) lag-1 autocorrelation and (c) stationarity in annual  $Q_{max}$  series across the 5,897 natural catchments (NAT). Corresponding maps illustrating (d) trends, (e) lag-1 autocorrelation, and (f) stationarity in annual  $Q_{max}$  series across the 5,172 human-impacted catchments (HUMAN). Insets in each map exhibit bars representing the percentage of catchments, with the numerical values above the bars indicating the count of catchments falling into each category.”

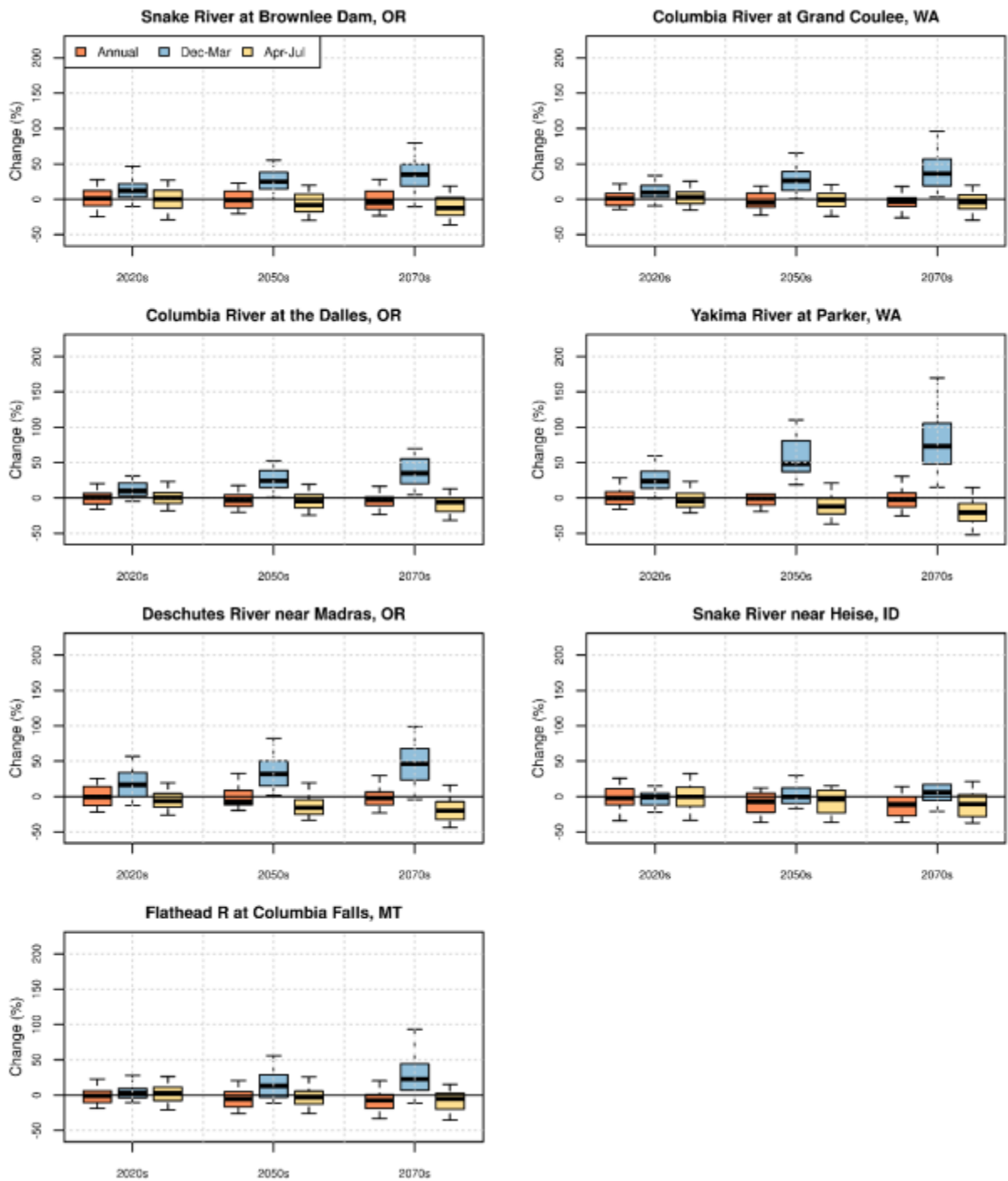


Figure C10. From Gangopadhyay and McGuire (2021): “Columbia River Basin – Simulated change in streamflow magnitude[from 1990s reference period] for various subbasins.”

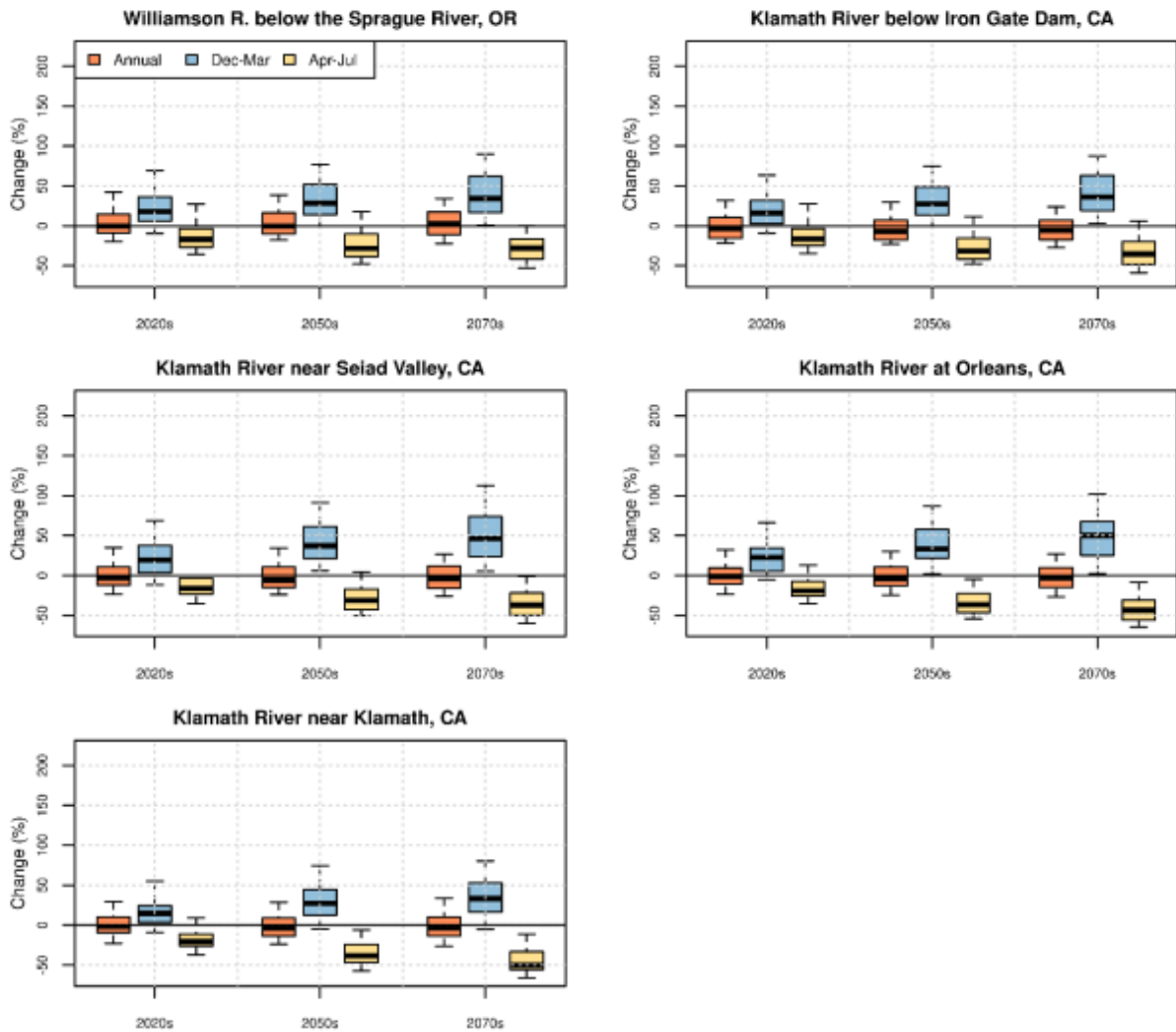


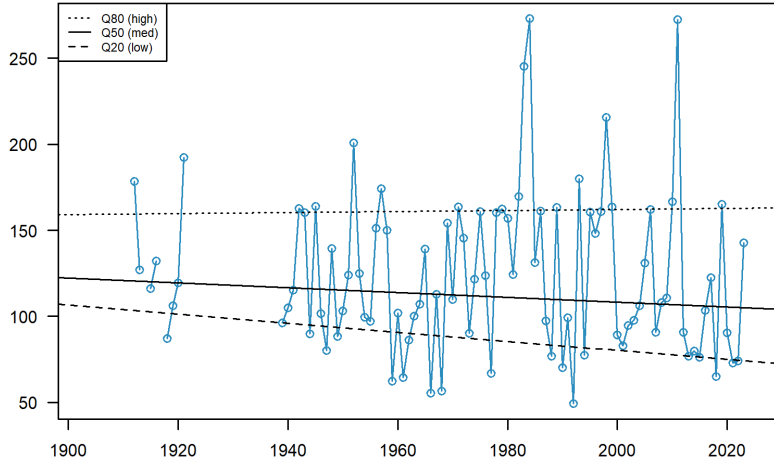
Figure C9. From Gangopadhyay and McGuire (2021): “Klamath River Basin – Simulated change in streamflow magnitude [from 1990s reference period] for various subbasins.”

## Appendix D: Individual Station Results – Quantile Regression – Long-term Period

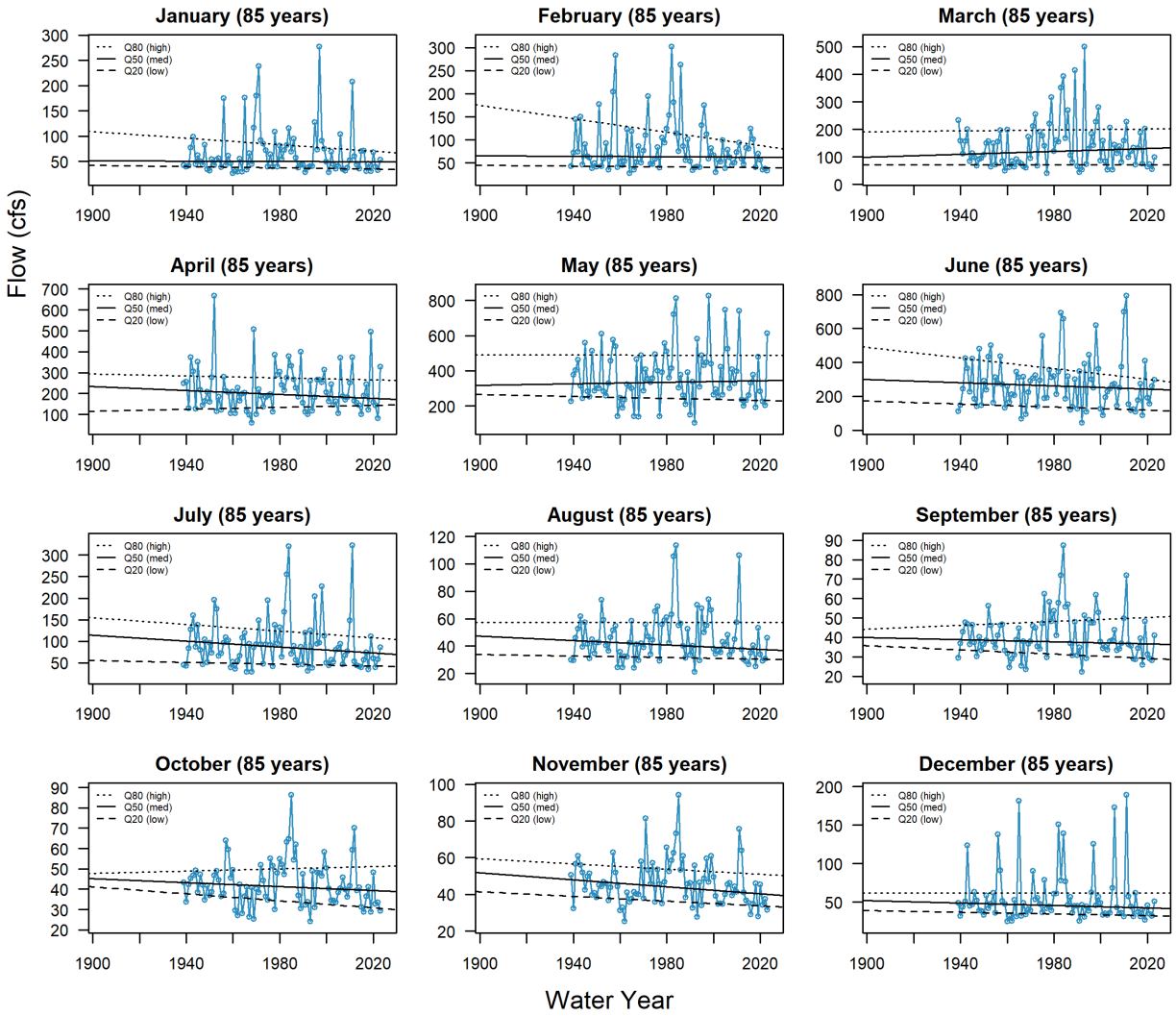
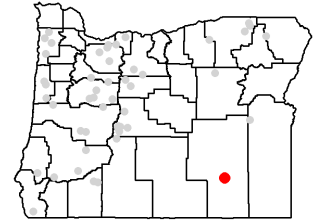
Quantile regression of streamflow stations for the long-term period (35 to 115 years). Each figure shows the 10-year moving average annual flow (top panel) and monthly flows (12 smaller panels) for 20th, 50th, and 80th non-exceedance percentile (Q) flows. Upward (▲) and downward (▼) triangles in legends indicate significant trends ( $p < 0.05$ ). Note that y-axis varies among subplots within the same figure.

# Long-term Flow Trends for Station #10396000

Annual Flow at Station #10396000 (93 years, 1912-2023)

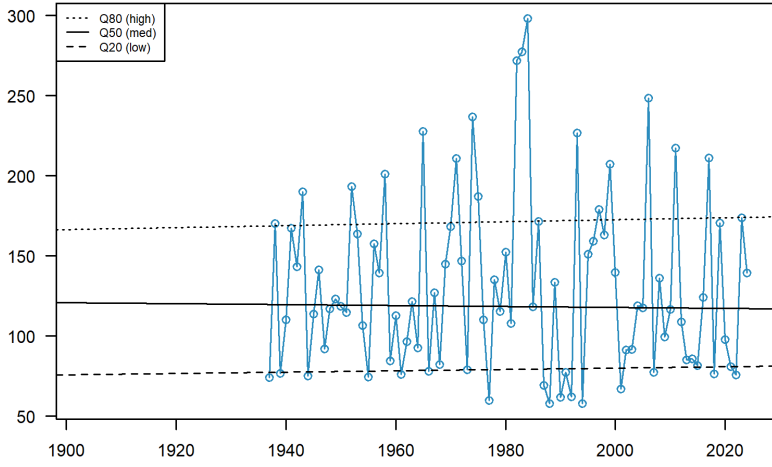


Station #10396000

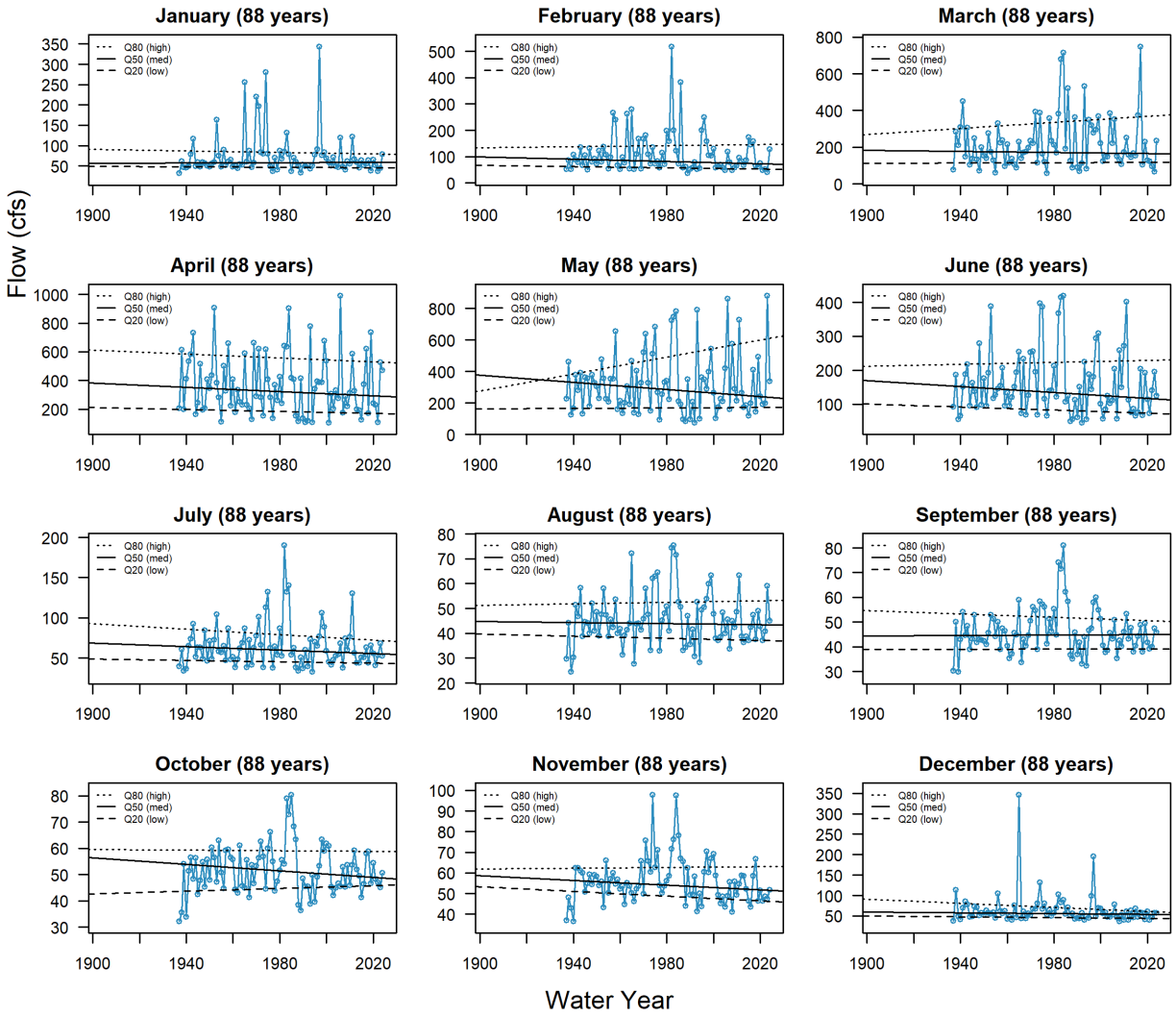
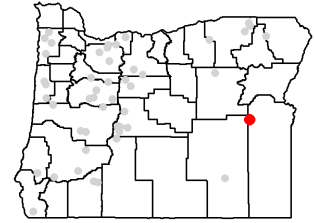


# Long-term Flow Trends for Station #13216500

Annual Flow at Station #13216500 (88 years, 1937-2024)

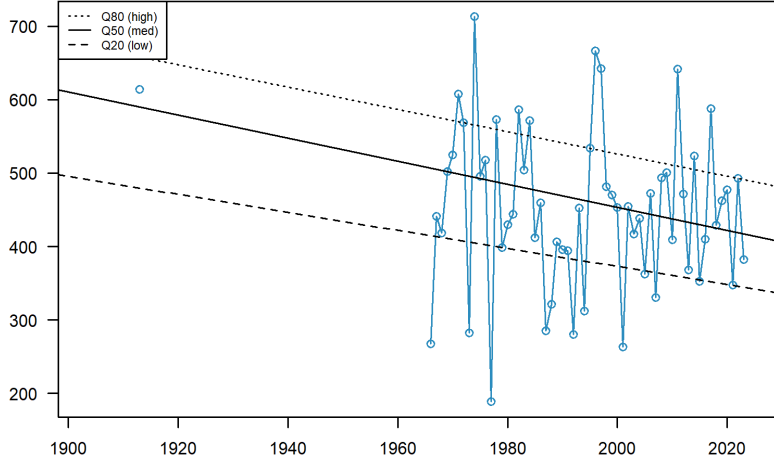


Station #13216500

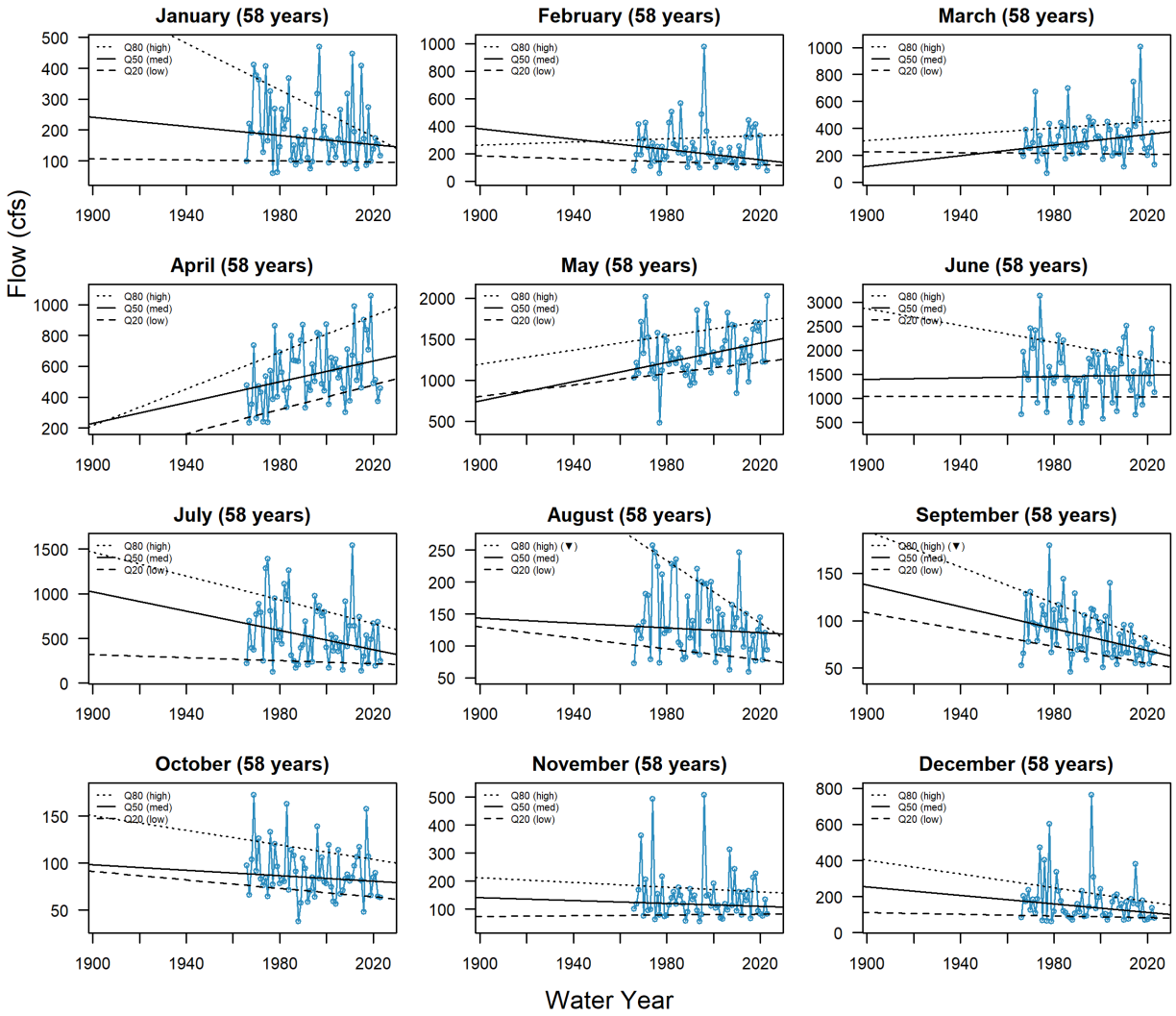
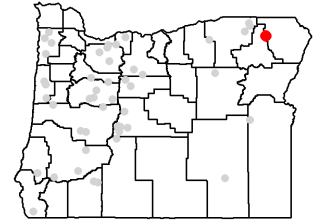


# Long-term Flow Trends for Station #13331500

## Annual Flow at Station #13331500 (59 years, 1913-2023)

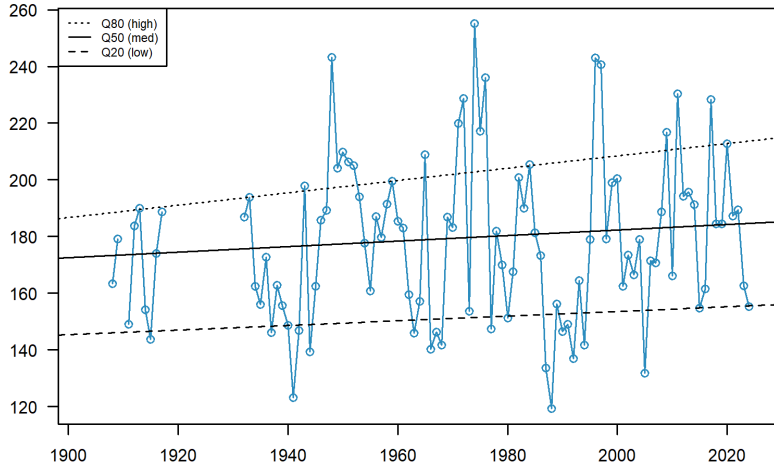


## Station #13331500

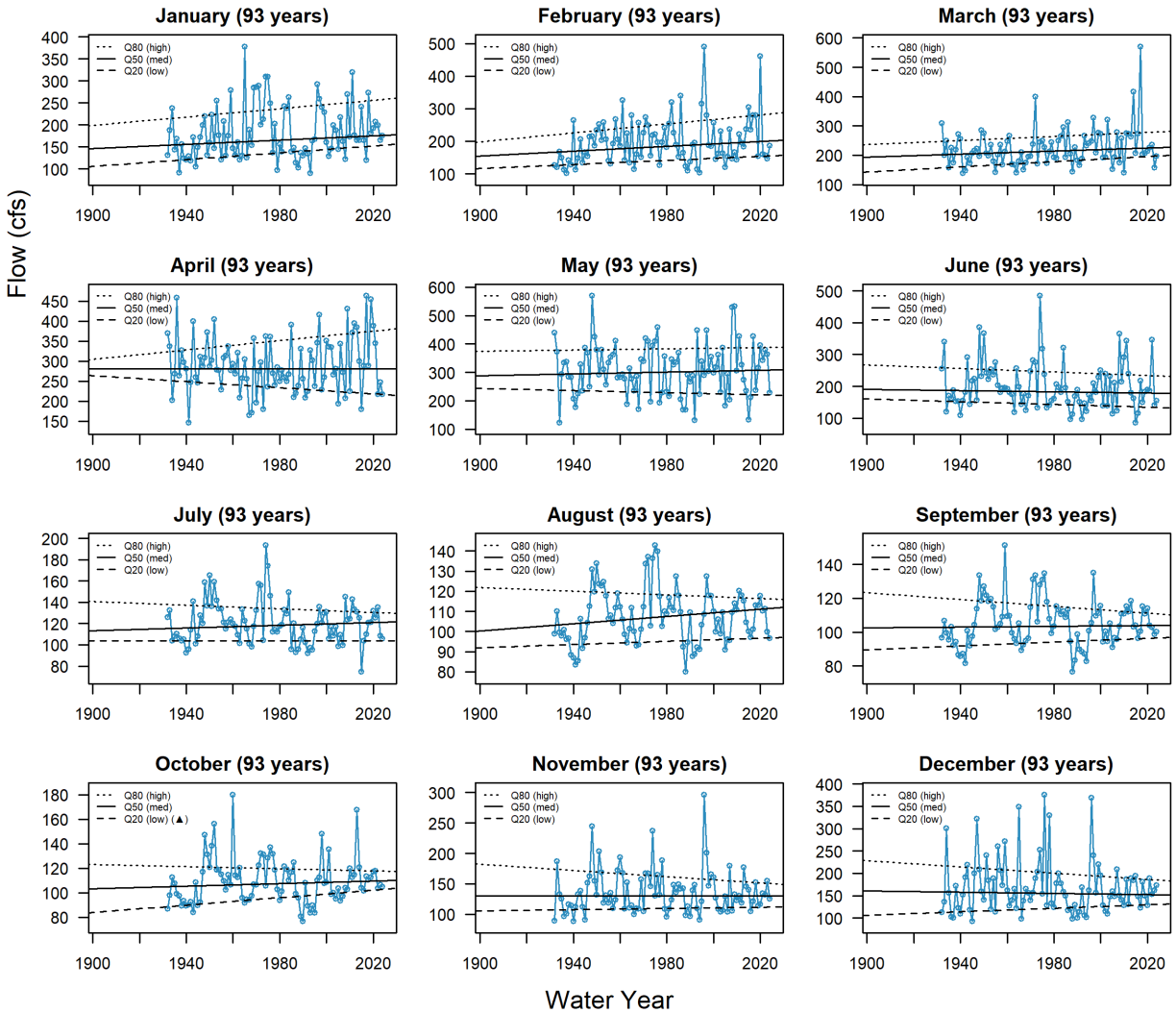
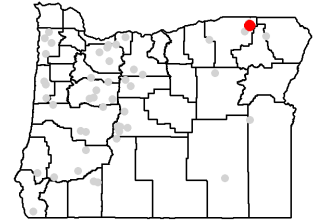


# Long-term Flow Trends for Station #14010000

Annual Flow at Station #14010000 (102 years, 1908-2024)

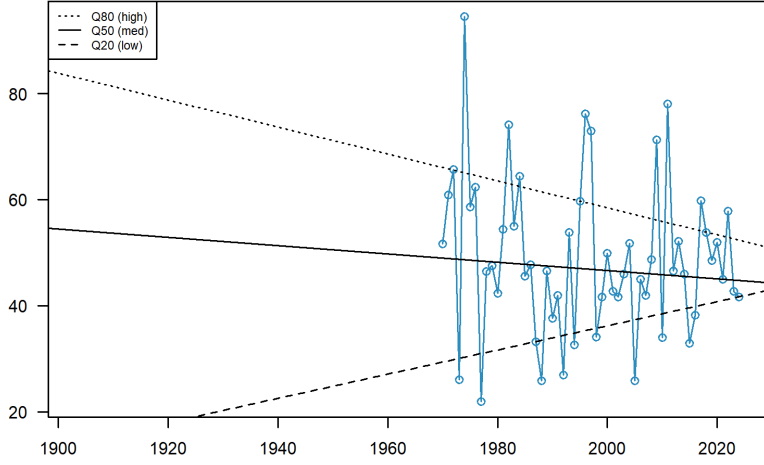


Station #14010000

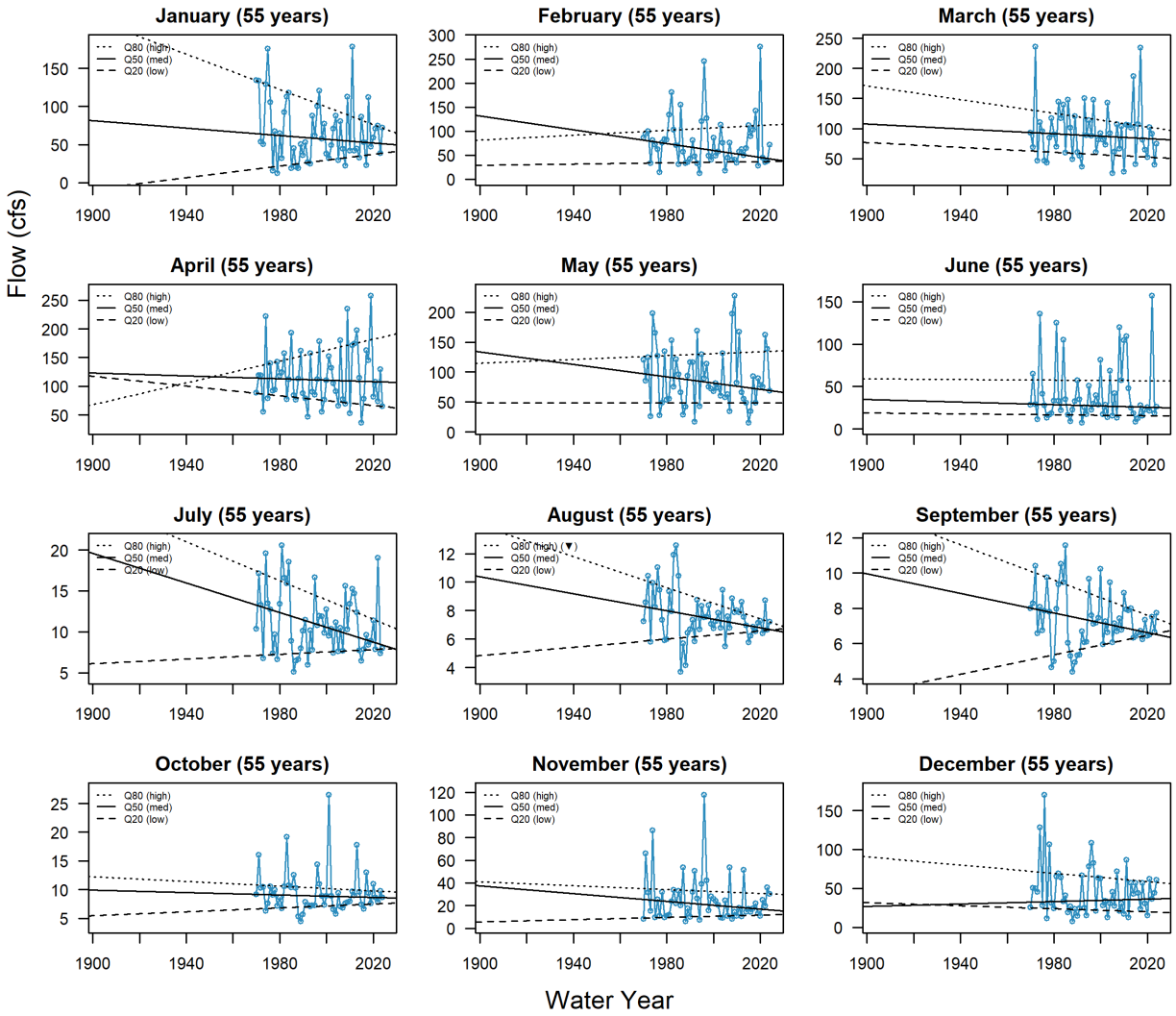
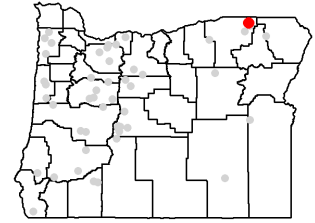


# Long-term Flow Trends for Station #14010800

## Annual Flow at Station #14010800 (55 years, 1970-2024)

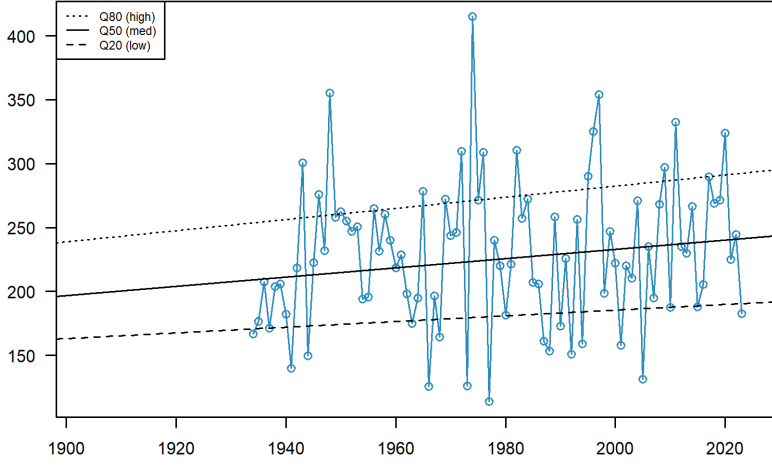


## Station #14010800

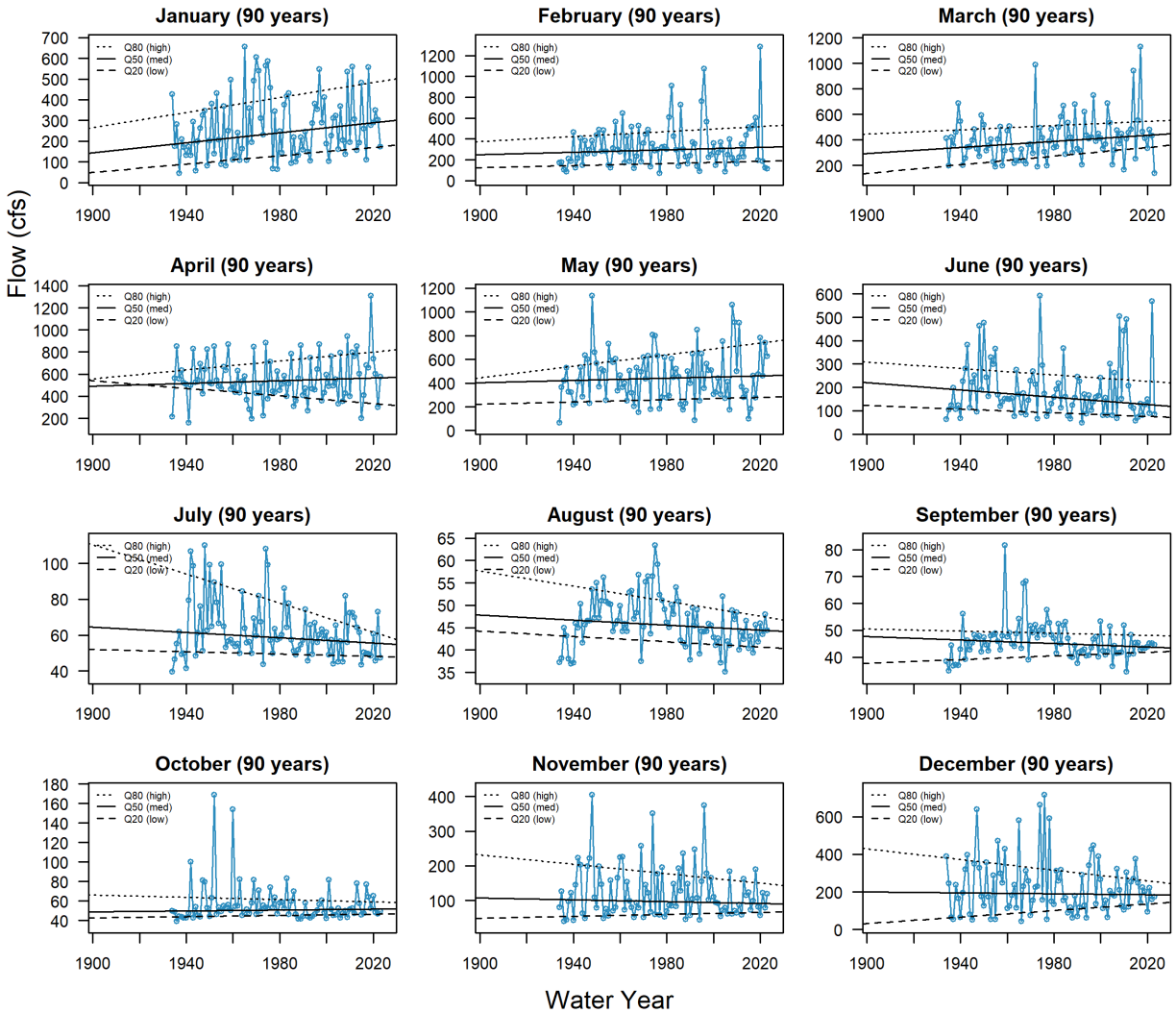
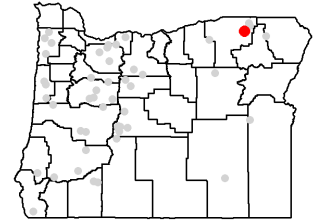


# Long-term Flow Trends for Station #14020000

## Annual Flow at Station #14020000 (90 years, 1934-2023)

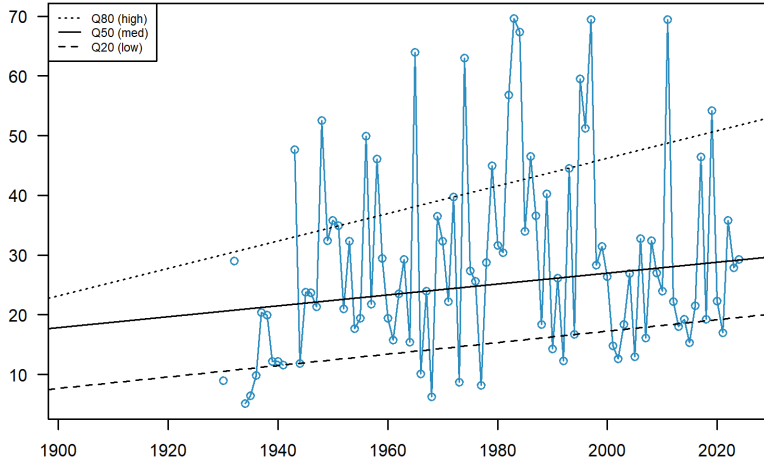


## Station #14020000

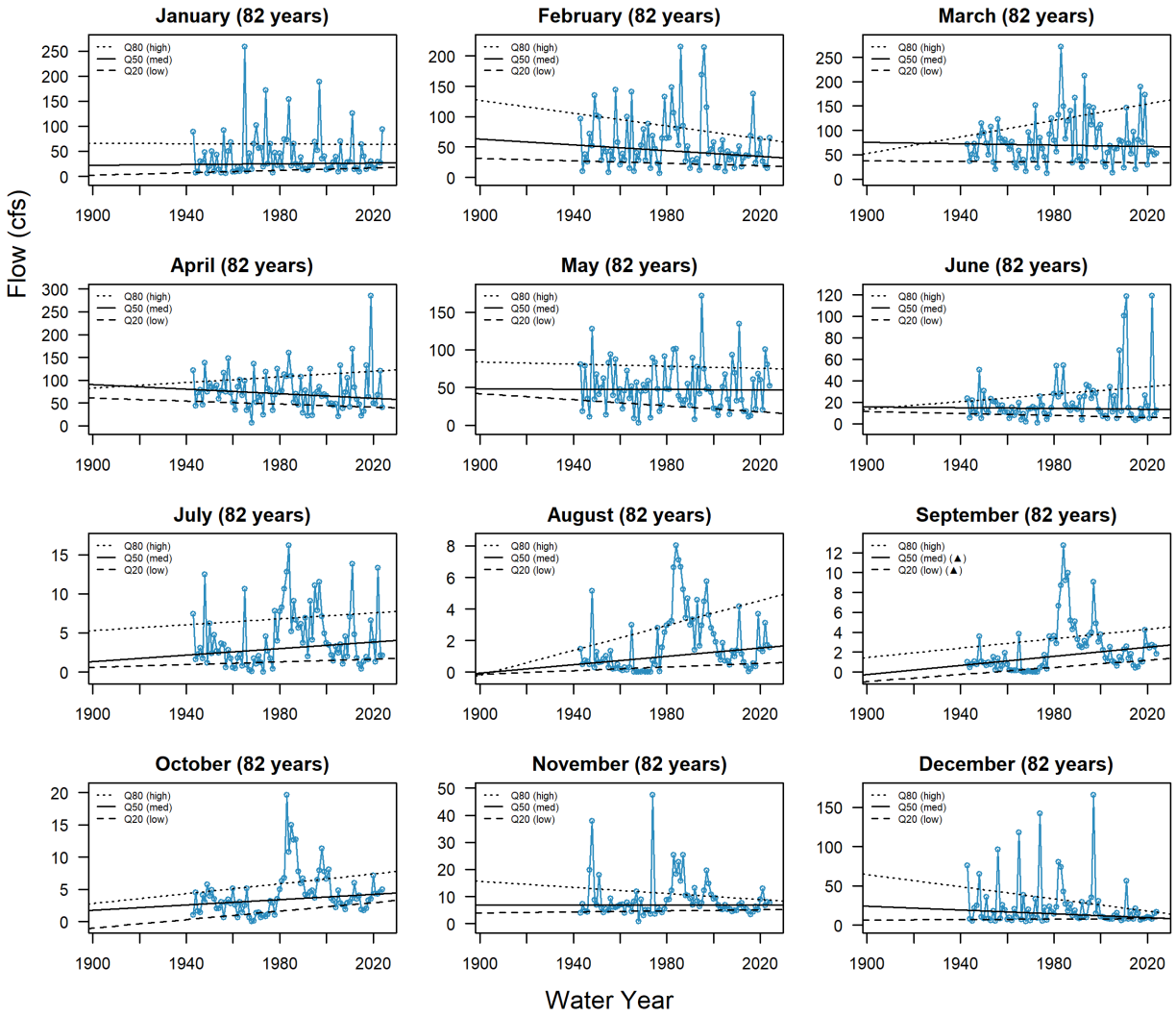
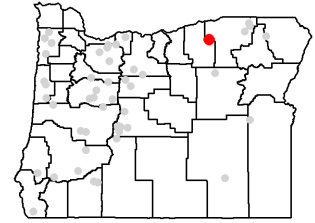


# Long-term Flow Trends for Station #14032000

Annual Flow at Station #14032000 (92 years, 1930-2024)

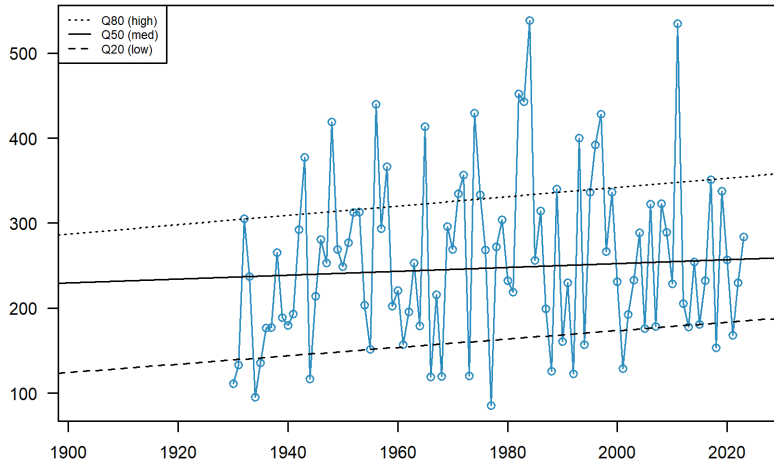


Station #14032000

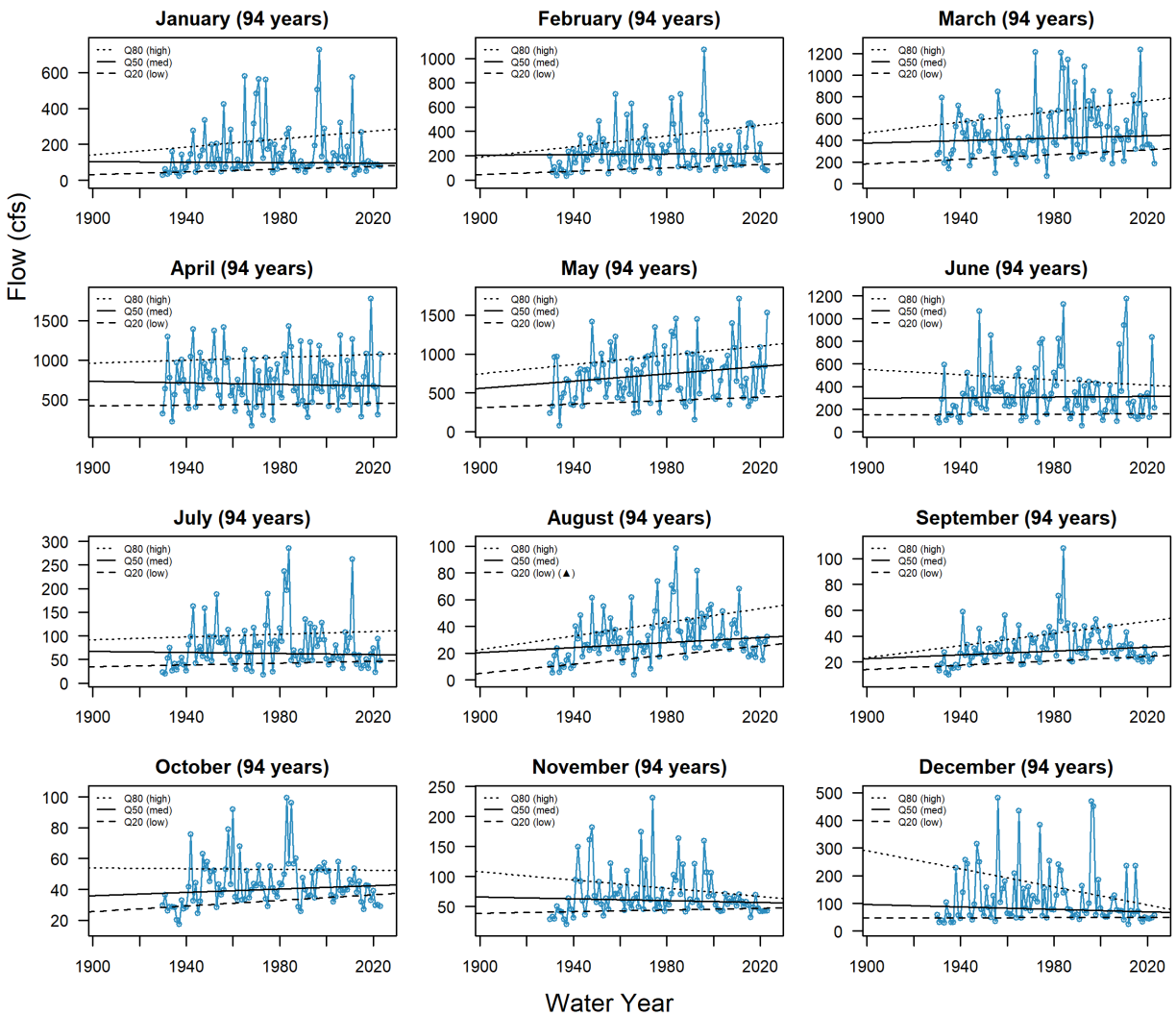
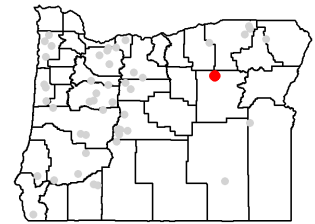


# Long-term Flow Trends for Station #14044000

Annual Flow at Station #14044000 (94 years, 1930-2023)

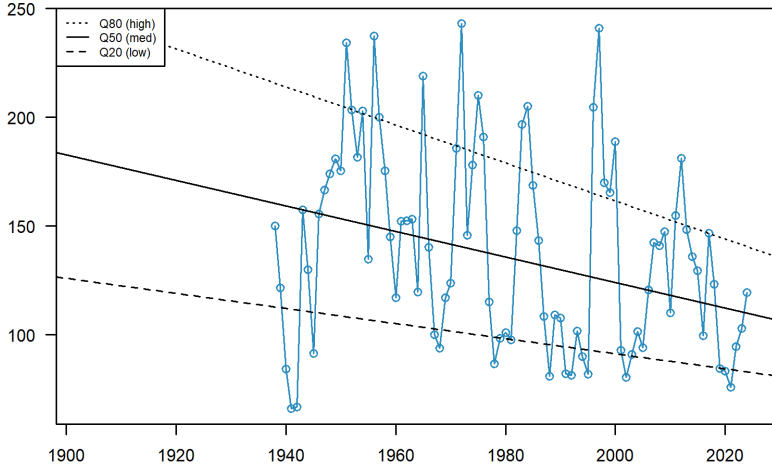


Station #14044000

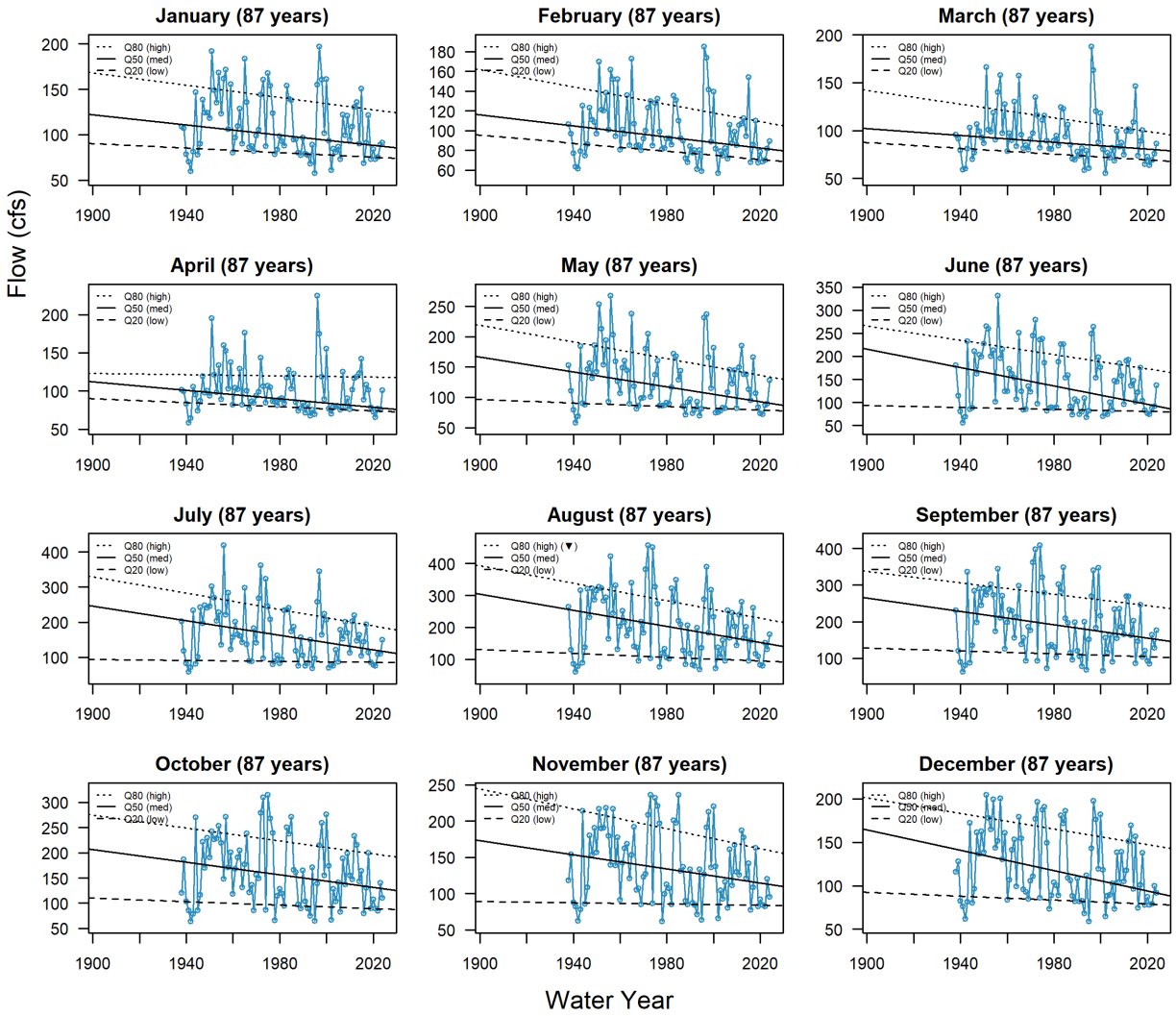
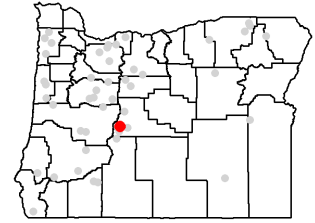


# Long-term Flow Trends for Station #14050000

## Annual Flow at Station #14050000 (87 years, 1938-2024)

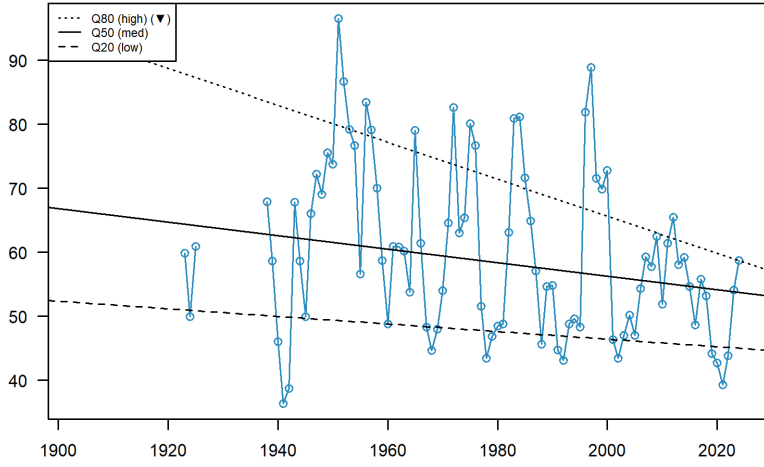


## Station #14050000

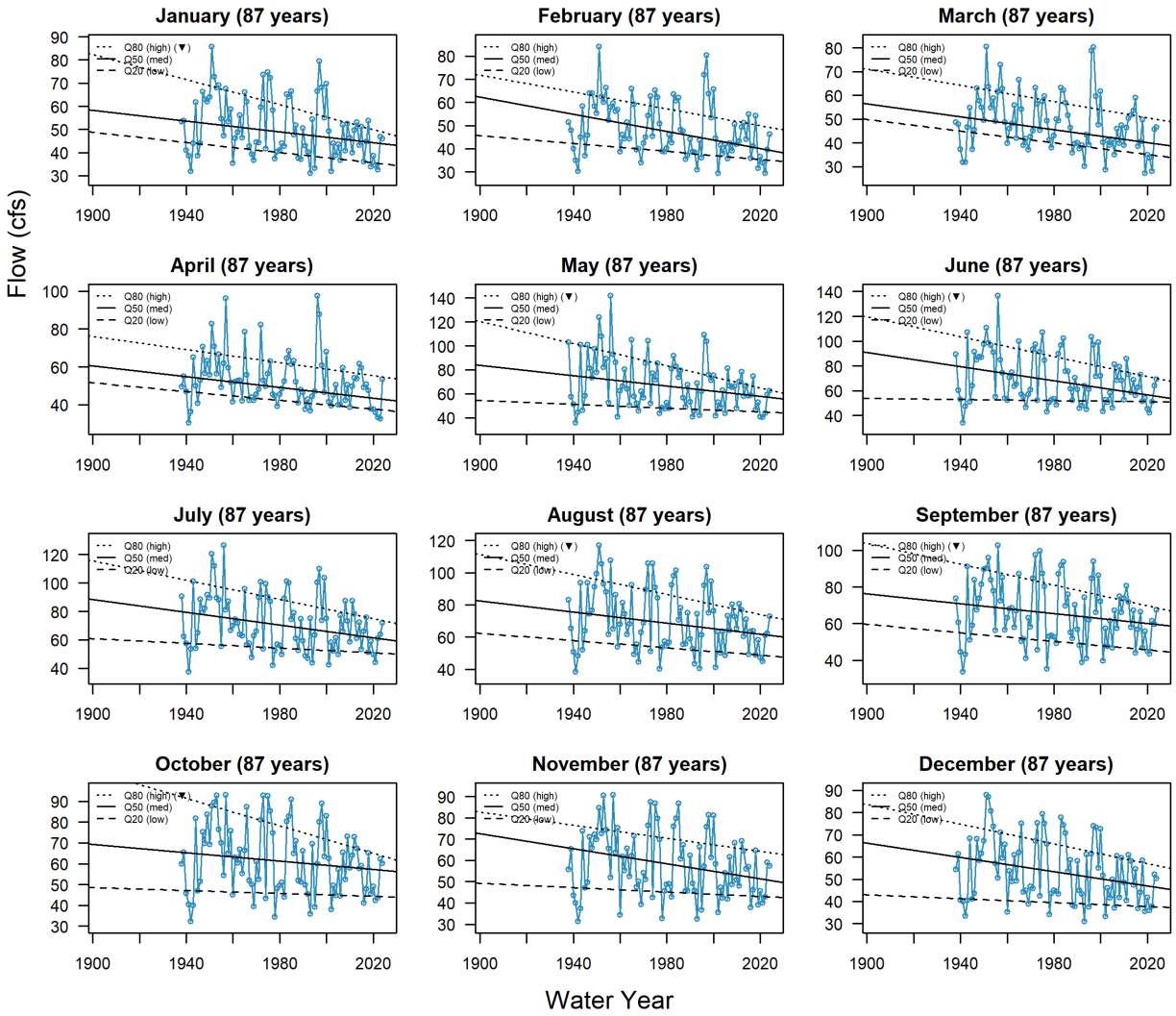
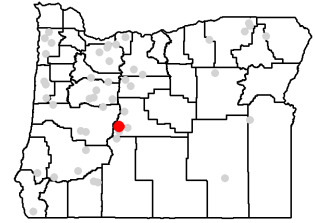


# Long-term Flow Trends for Station #14050500

## Annual Flow at Station #14050500 (90 years, 1923-2024)

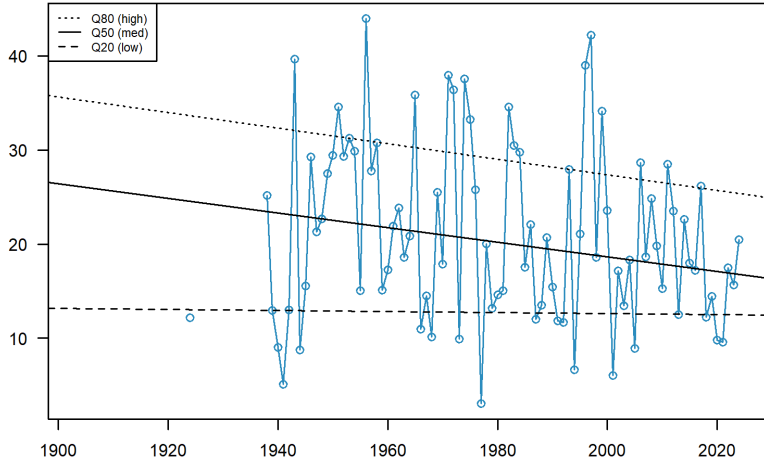


## Station #14050500

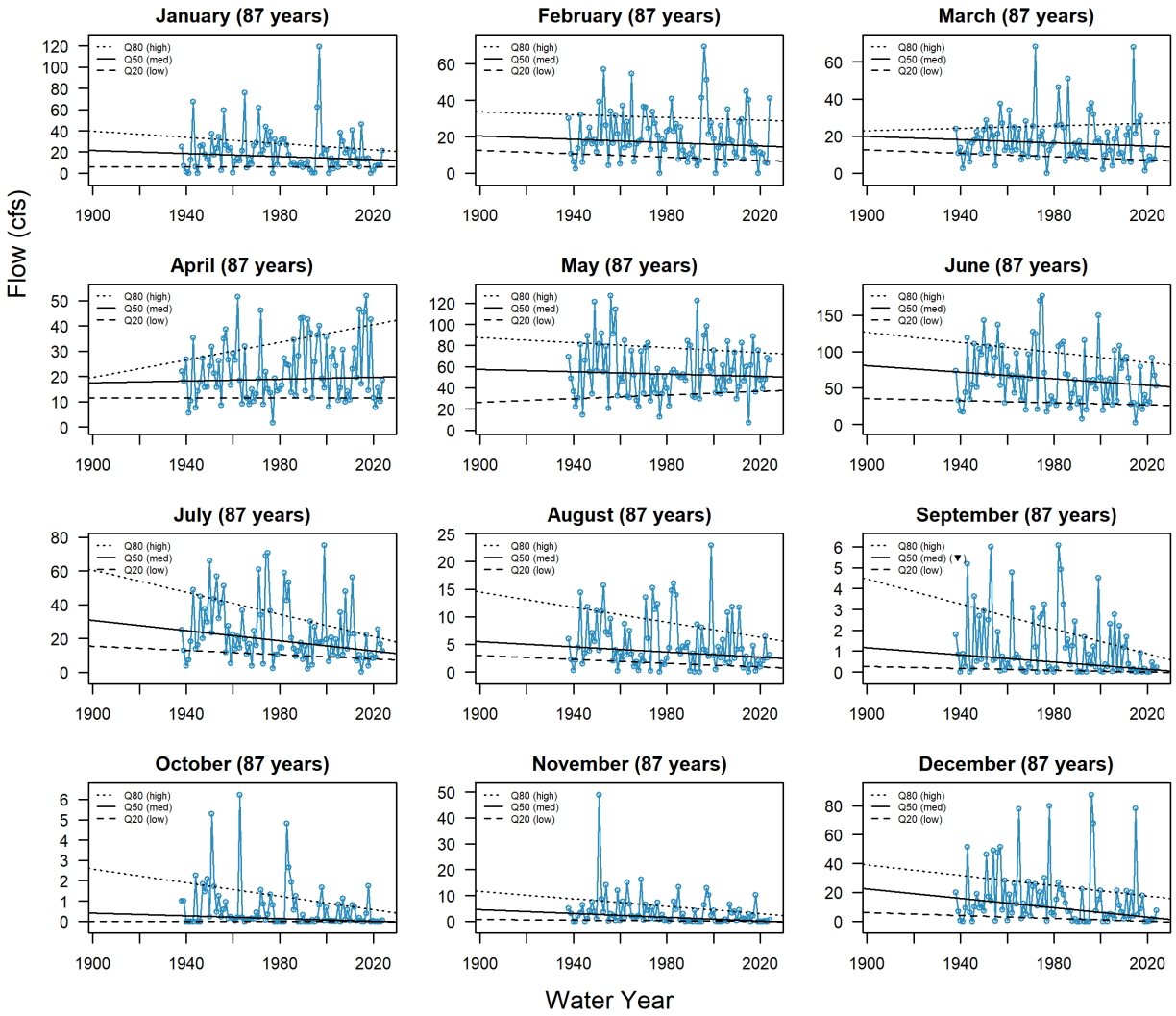
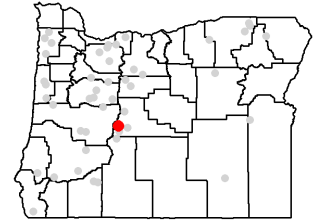


# Long-term Flow Trends for Station #14051000

Annual Flow at Station #14051000 (88 years, 1924-2024)

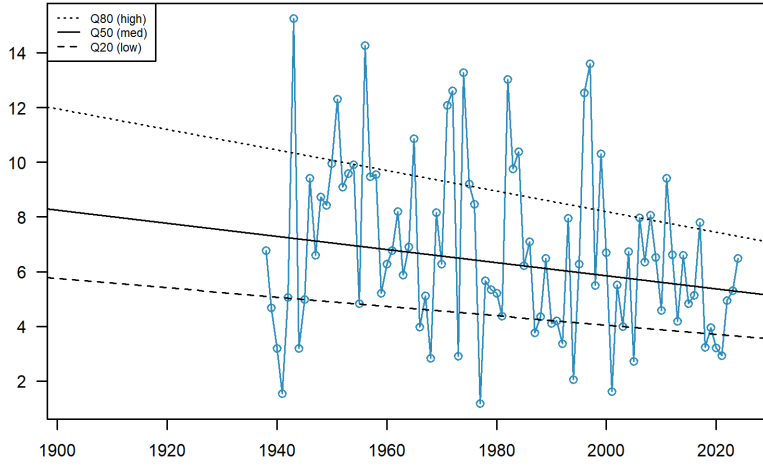


Station #14051000

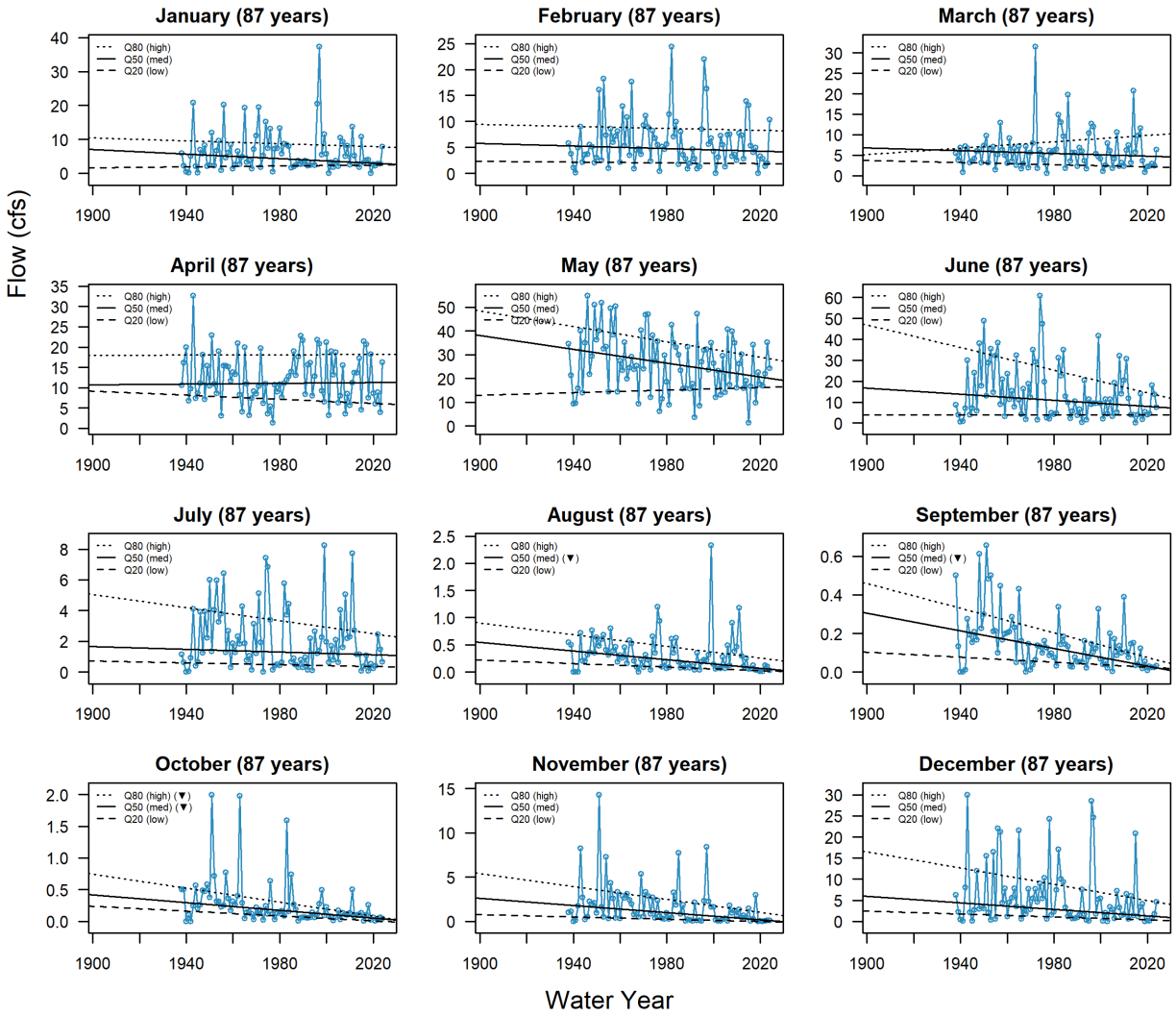
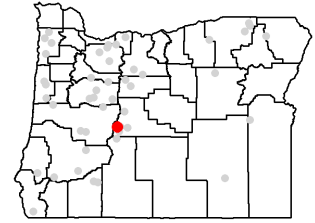


# Long-term Flow Trends for Station #14052000

## Annual Flow at Station #14052000 (87 years, 1938-2024)

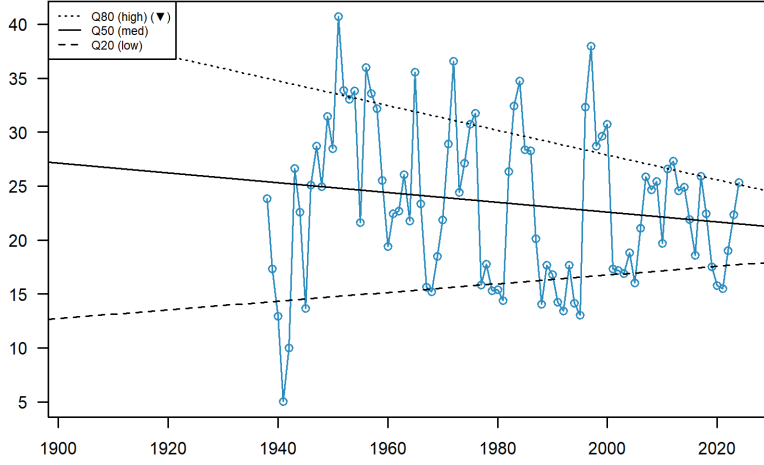


## Station #14052000

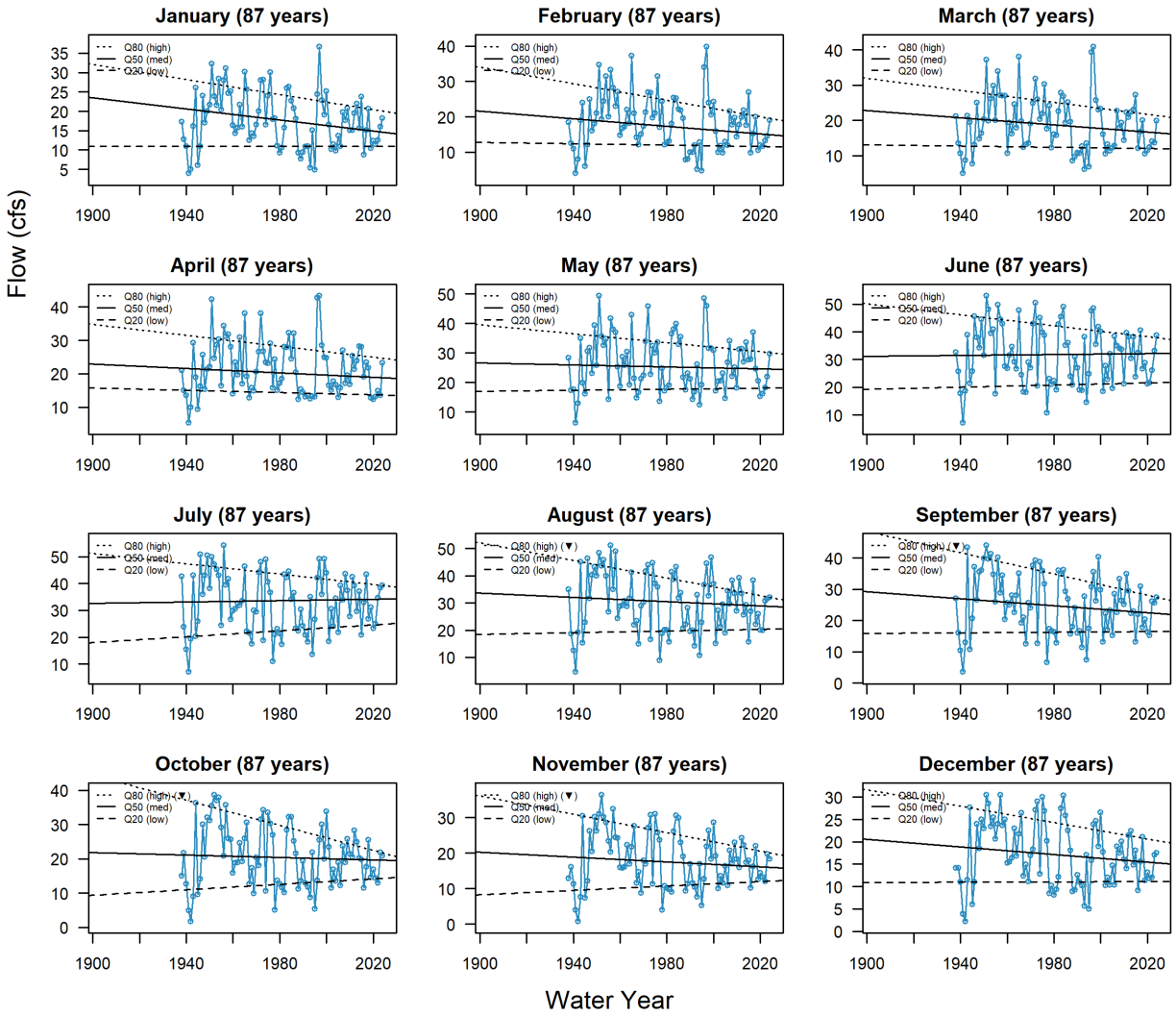
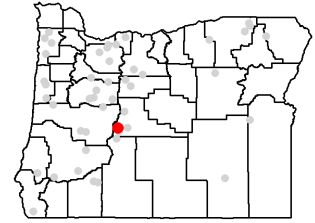


# Long-term Flow Trends for Station #14052500

Annual Flow at Station #14052500 (87 years, 1938-2024)

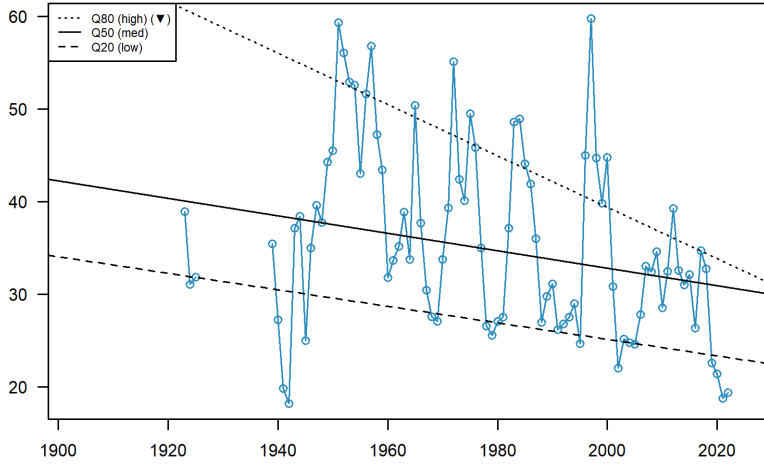


Station #14052500

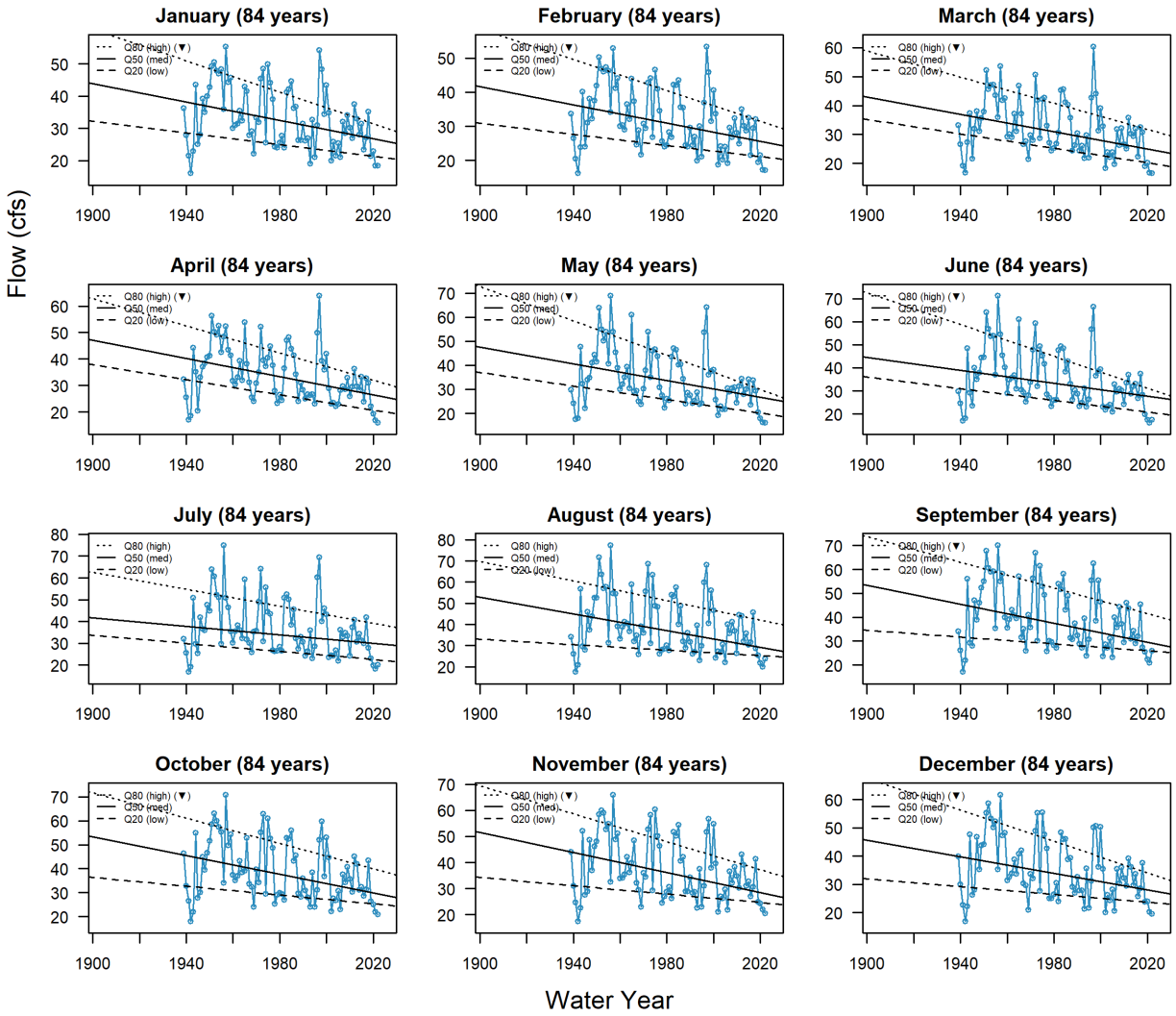
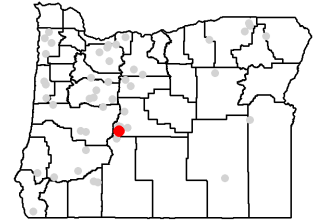


# Long-term Flow Trends for Station #14054500

## Annual Flow at Station #14054500 (87 years, 1923-2022)

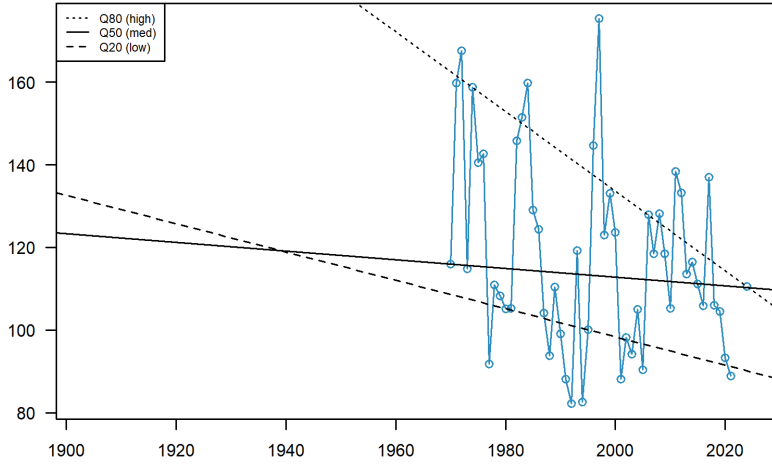


## Station #14054500

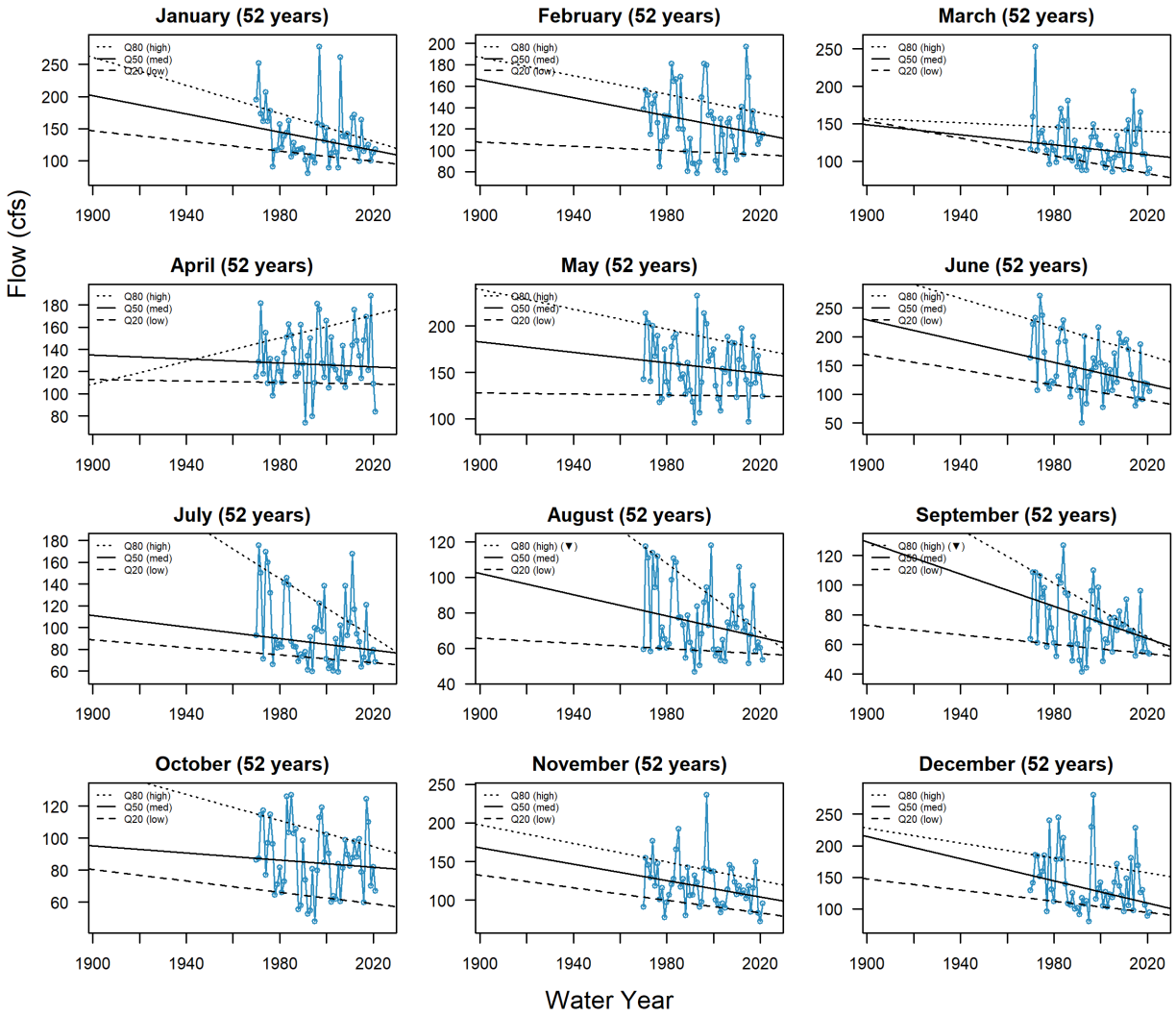
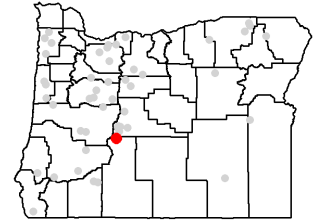


# Long-term Flow Trends for Station #14055600

## Annual Flow at Station #14055600 (53 years, 1970-2024)

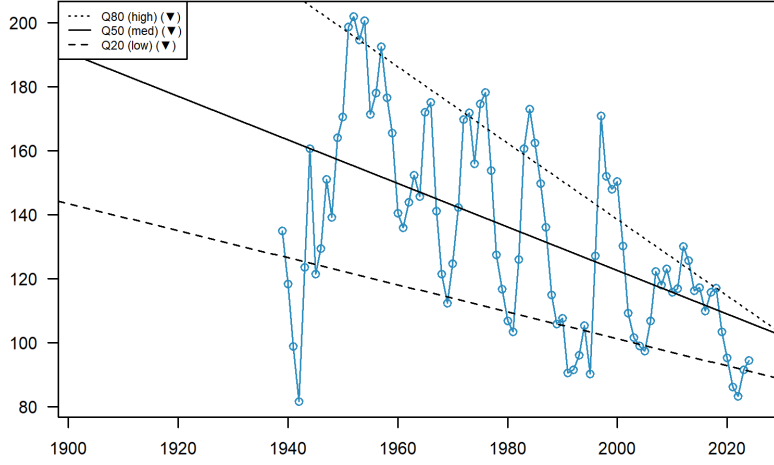


## Station #14055600

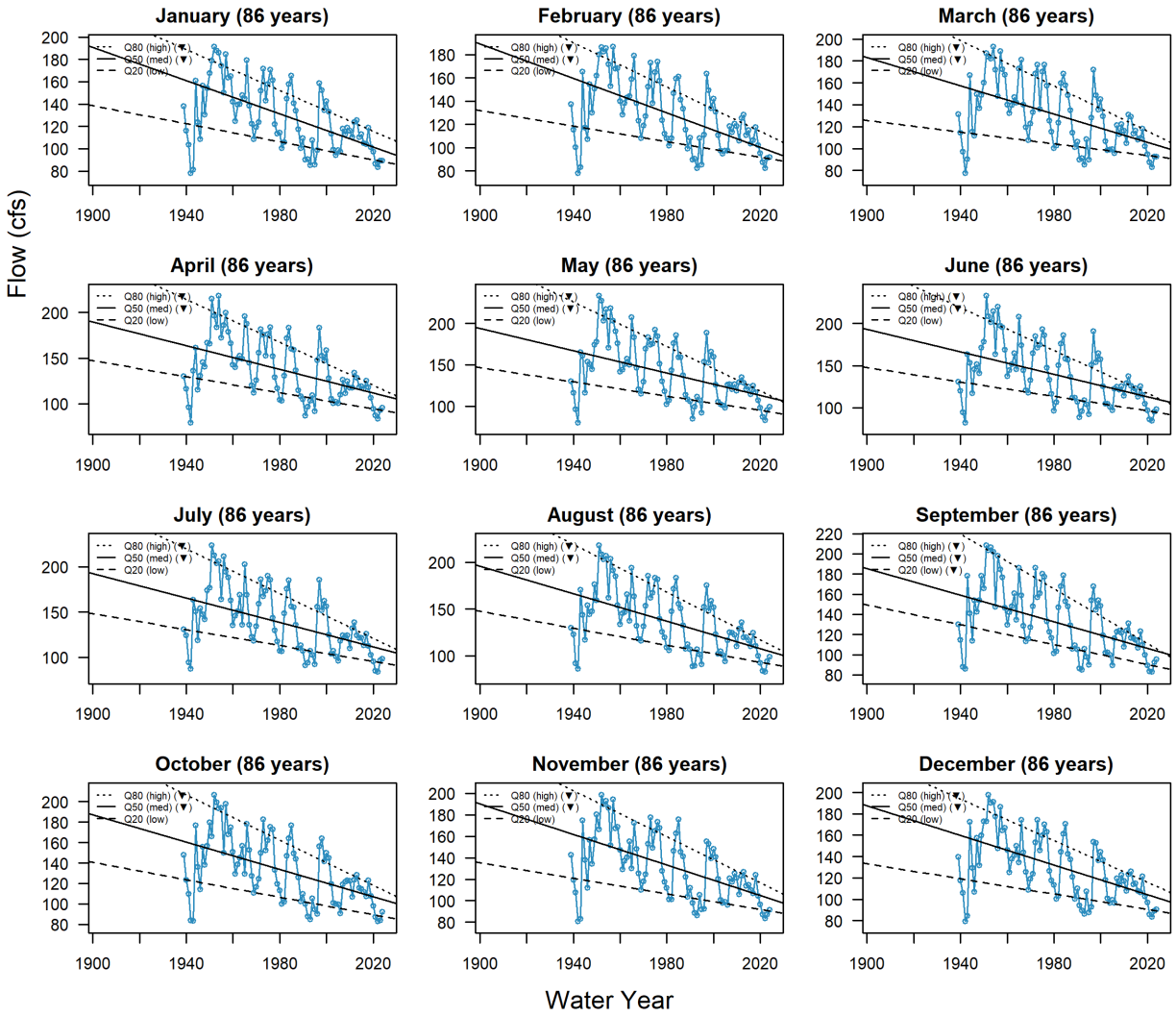
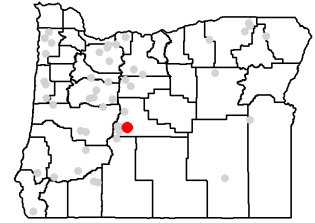


# Long-term Flow Trends for Station #14057500

Annual Flow at Station #14057500 (86 years, 1939-2024)

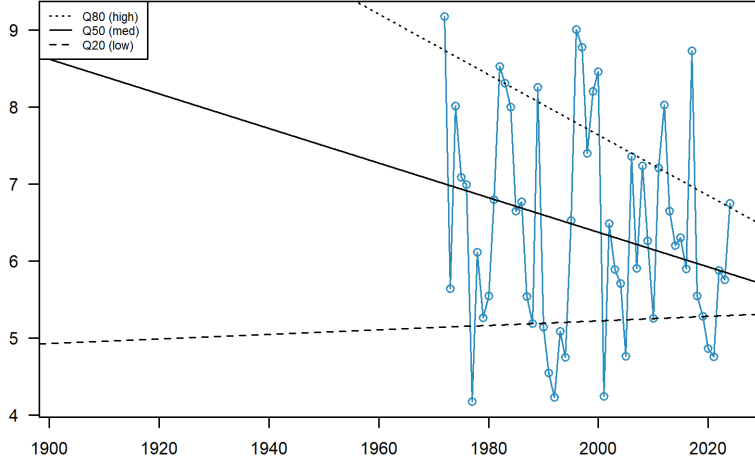


Station #14057500

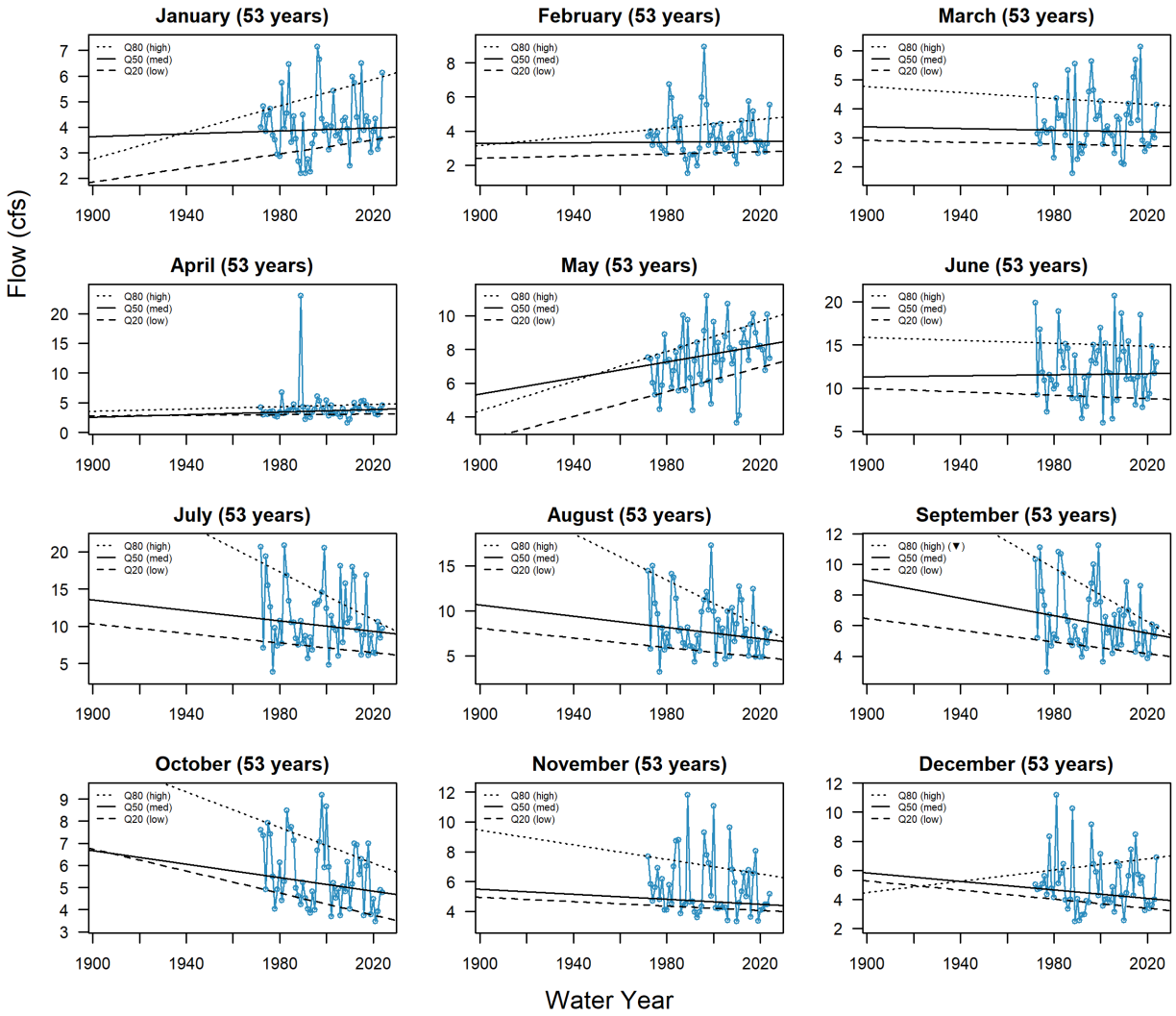
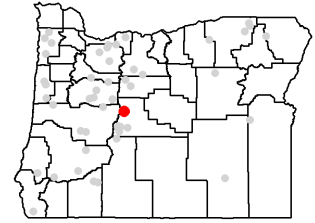


# Long-term Flow Trends for Station #14074900

## Annual Flow at Station #14074900 (53 years, 1972-2024)

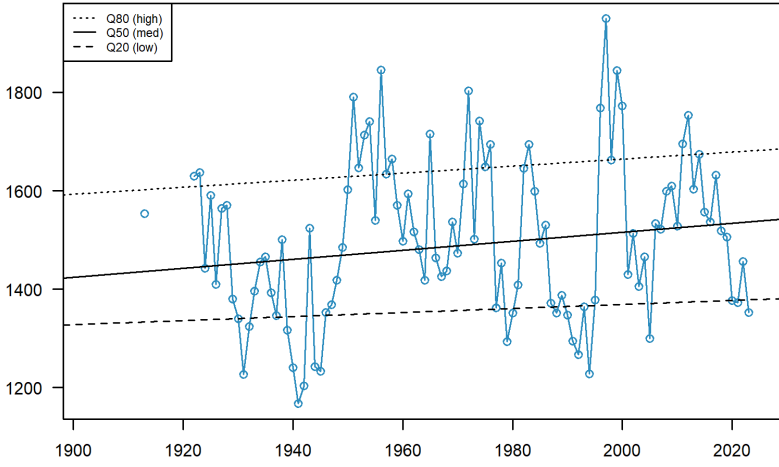


## Station #14074900

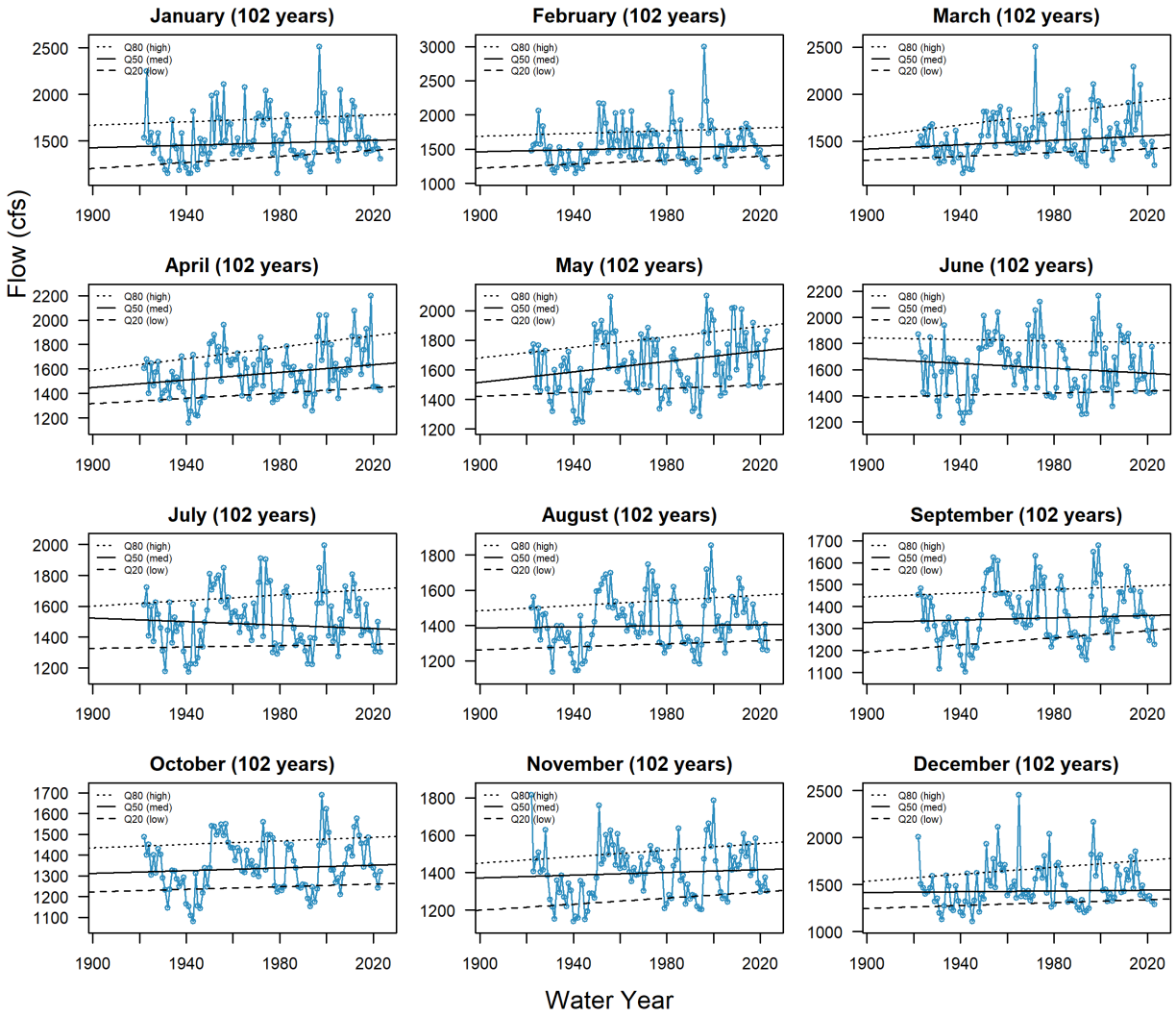
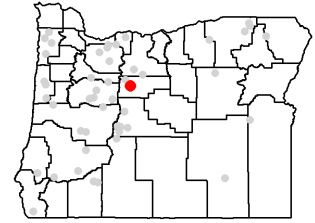


# Long-term Flow Trends for Station #14091500

Annual Flow at Station #14091500 (103 years, 1913-2023)

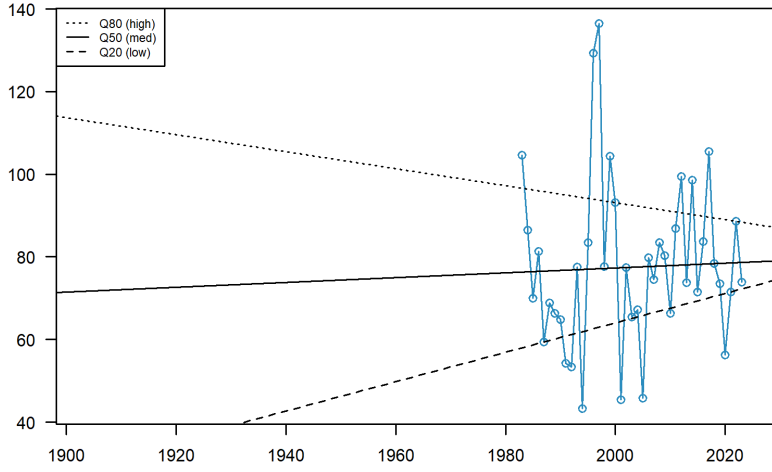


Station #14091500

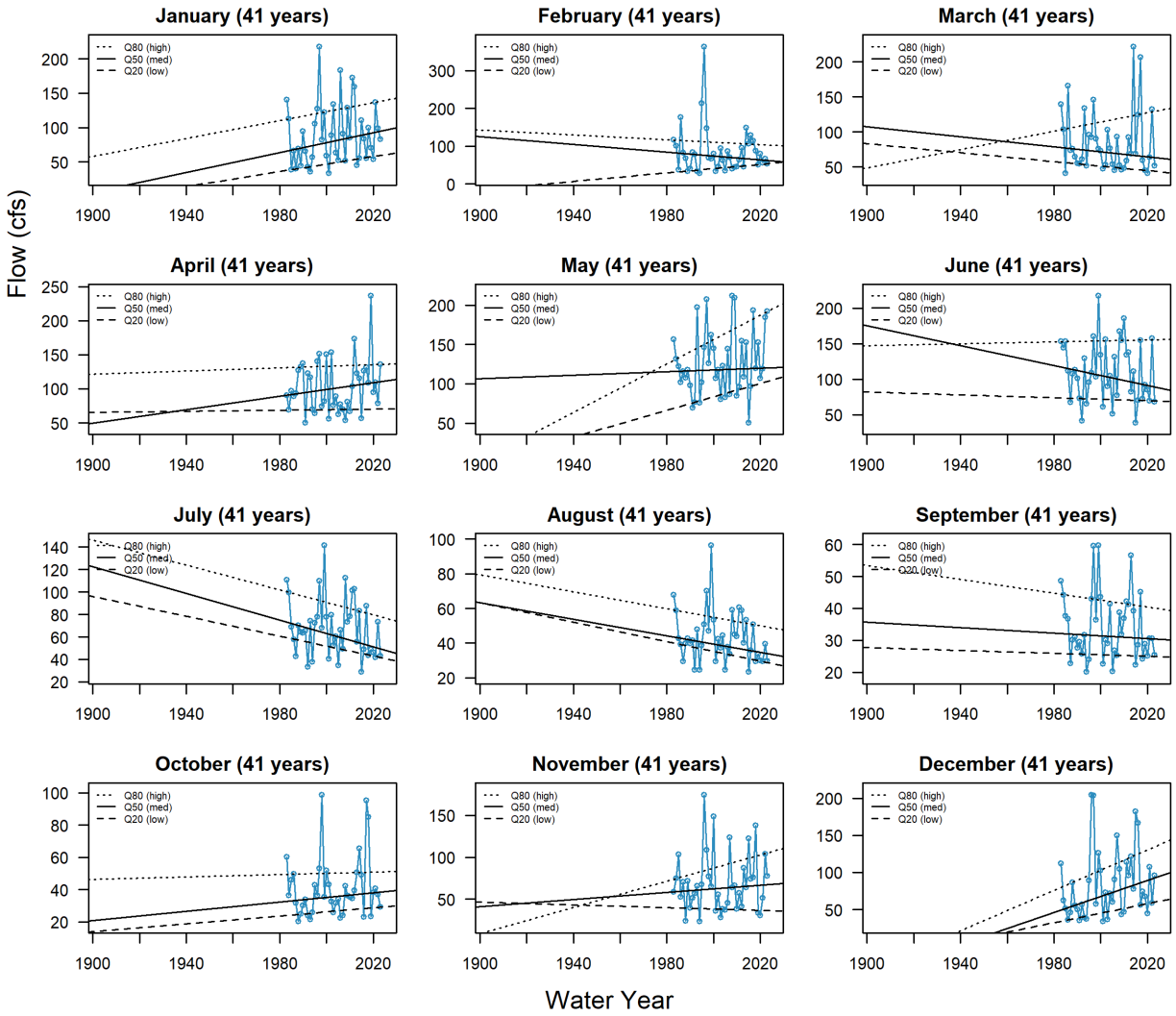
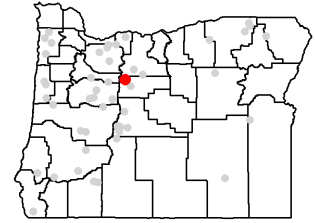


# Long-term Flow Trends for Station #14092750

Annual Flow at Station #14092750 (41 years, 1983-2023)

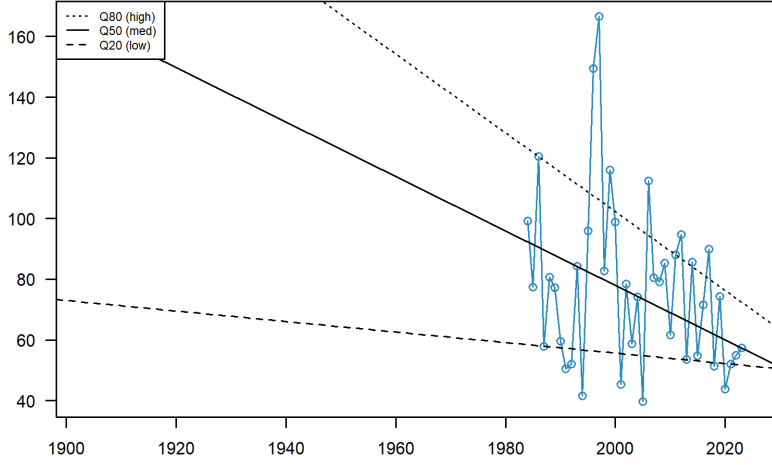


Station #14092750

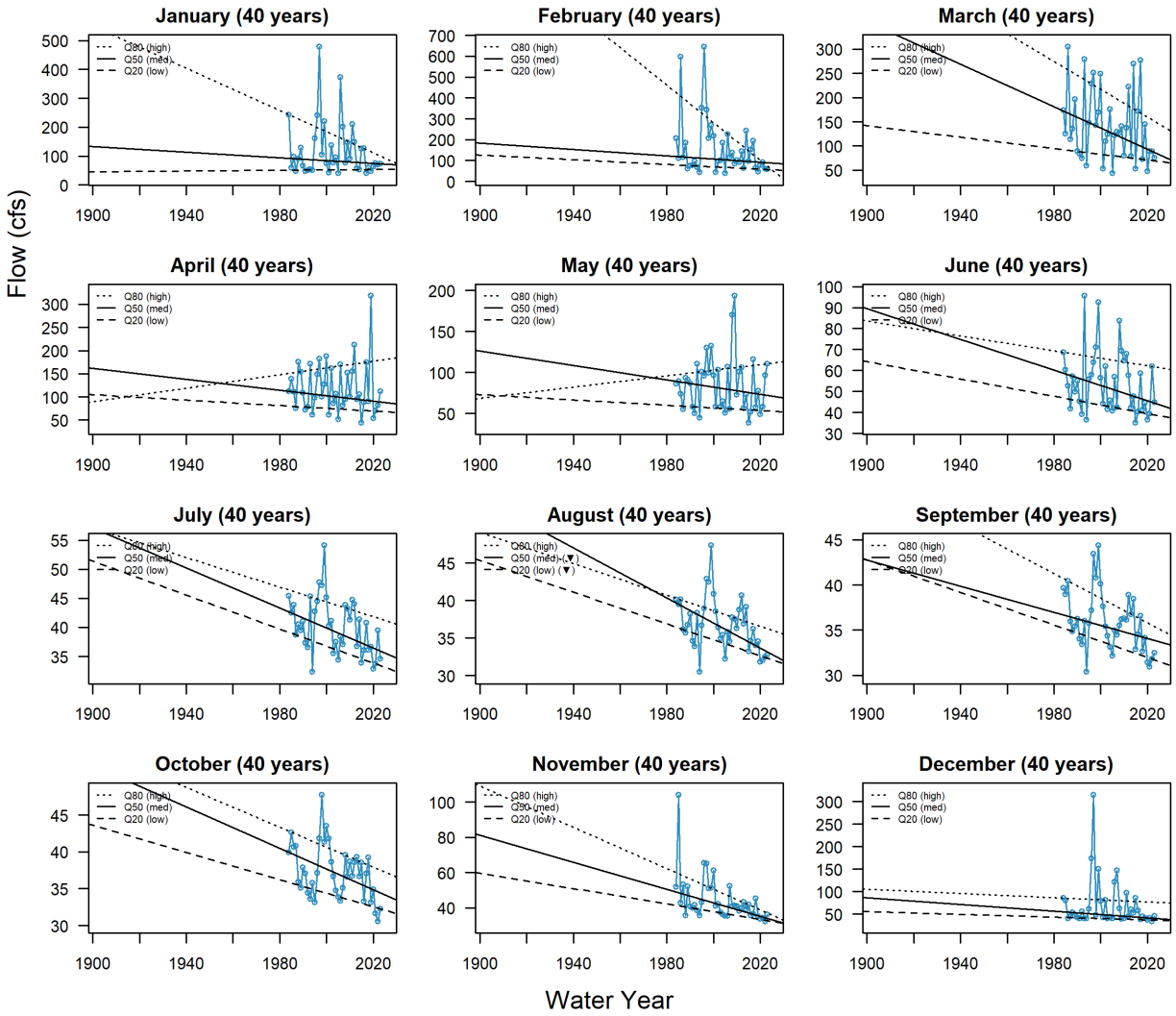
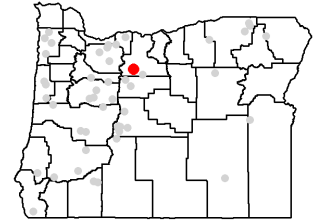


# Long-term Flow Trends for Station #14096850

Annual Flow at Station #14096850 (40 years, 1984-2023)

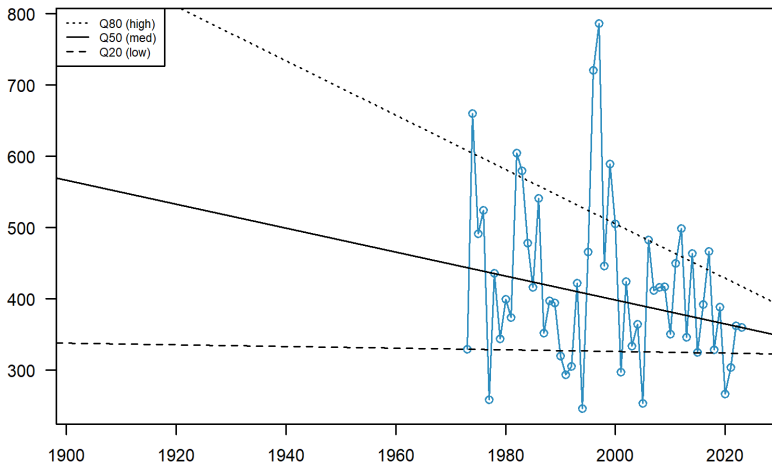


Station #14096850

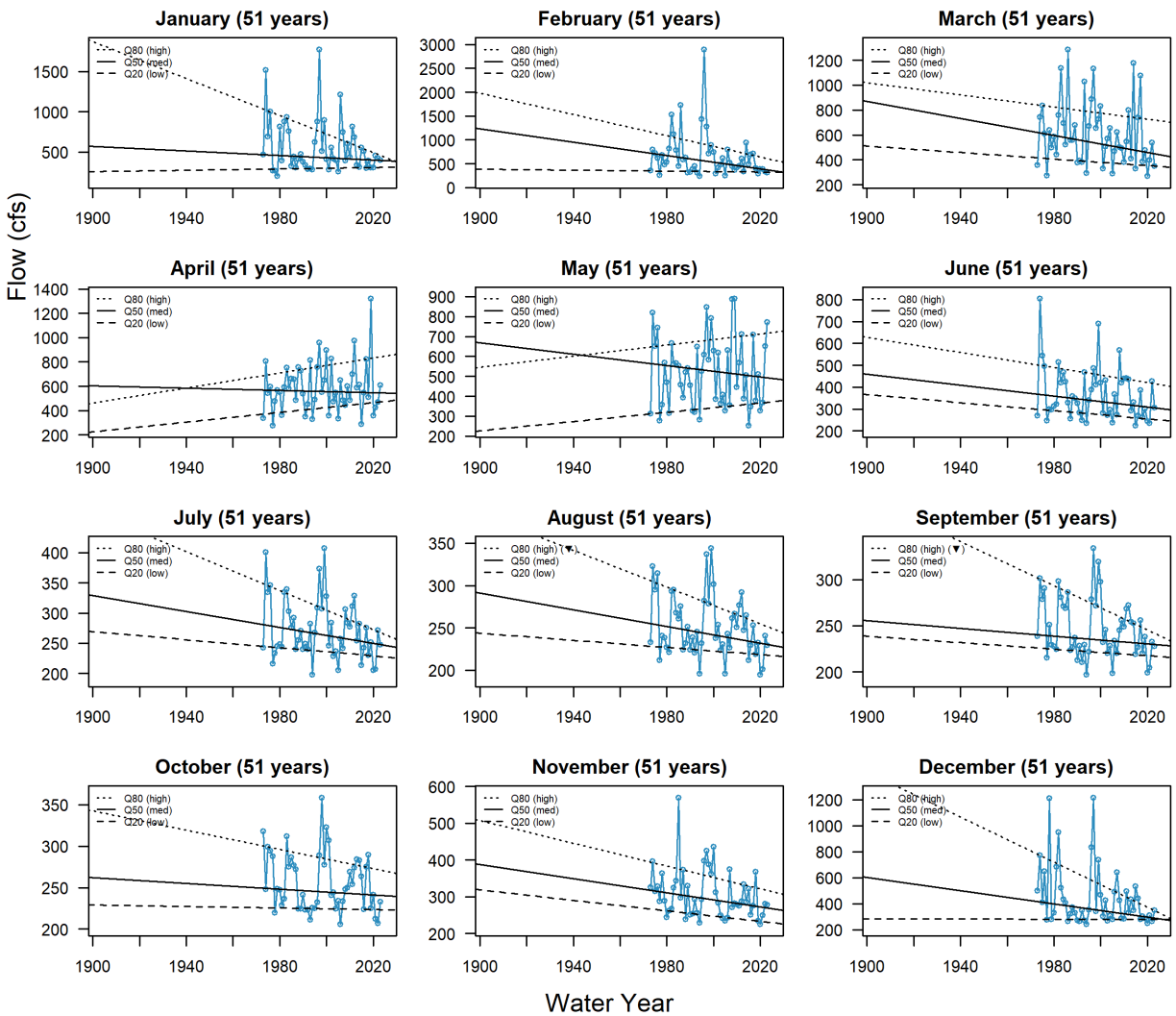
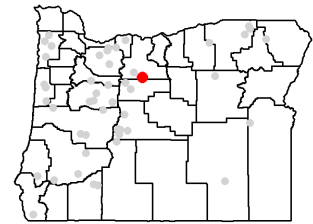


# Long-term Flow Trends for Station #14097100

Annual Flow at Station #14097100 (51 years, 1973-2023)

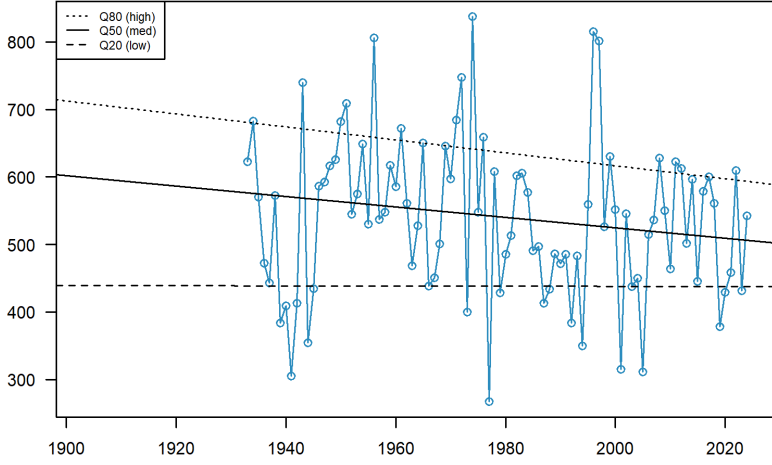


Station #14097100

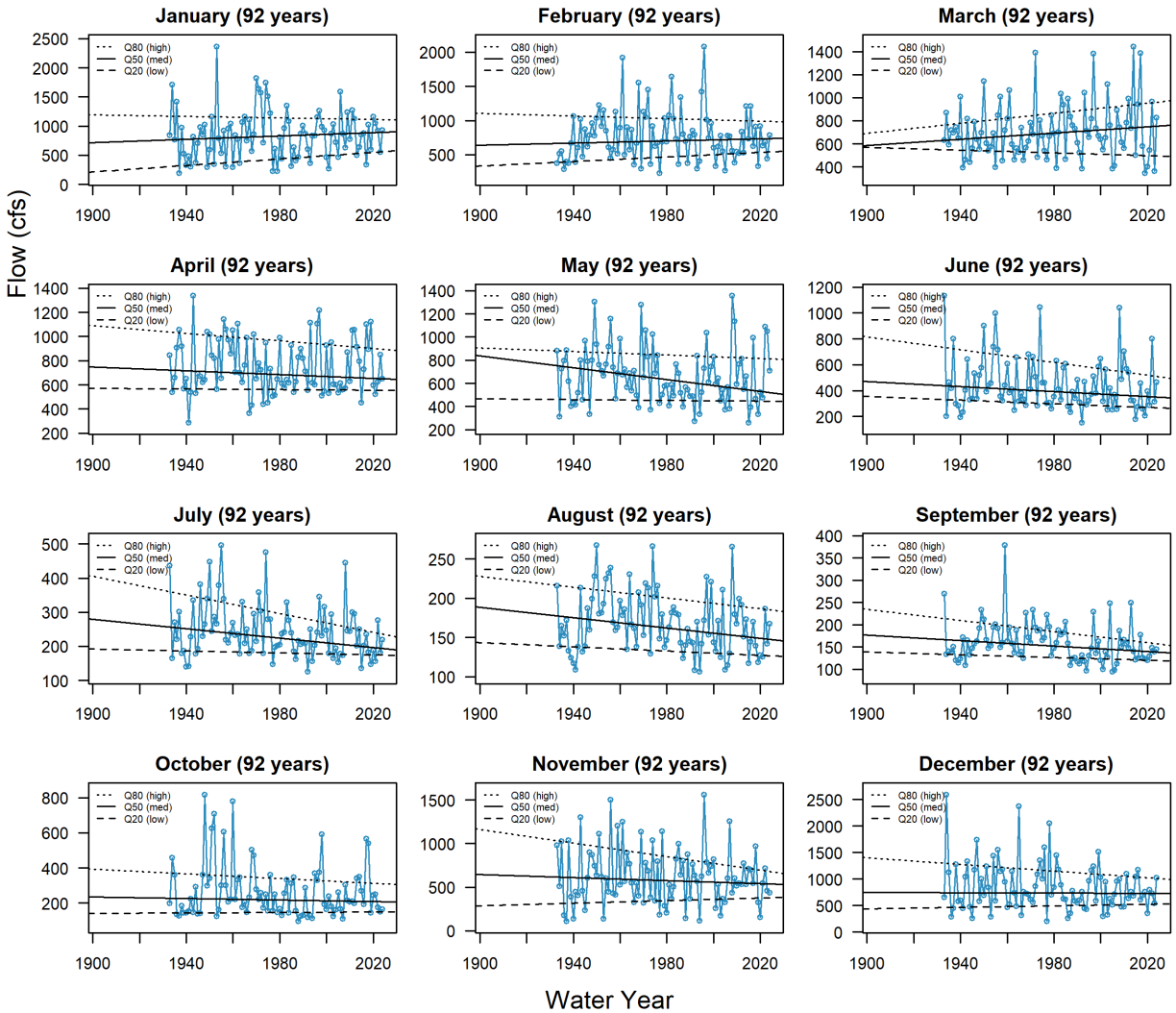
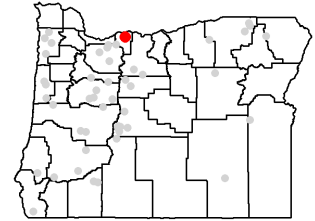


# Long-term Flow Trends for Station #14118500

Annual Flow at Station #14118500 (92 years, 1933-2024)

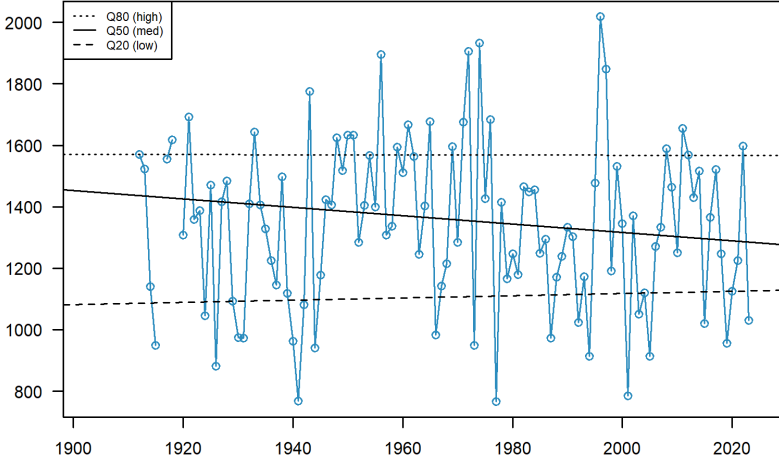


Station #14118500

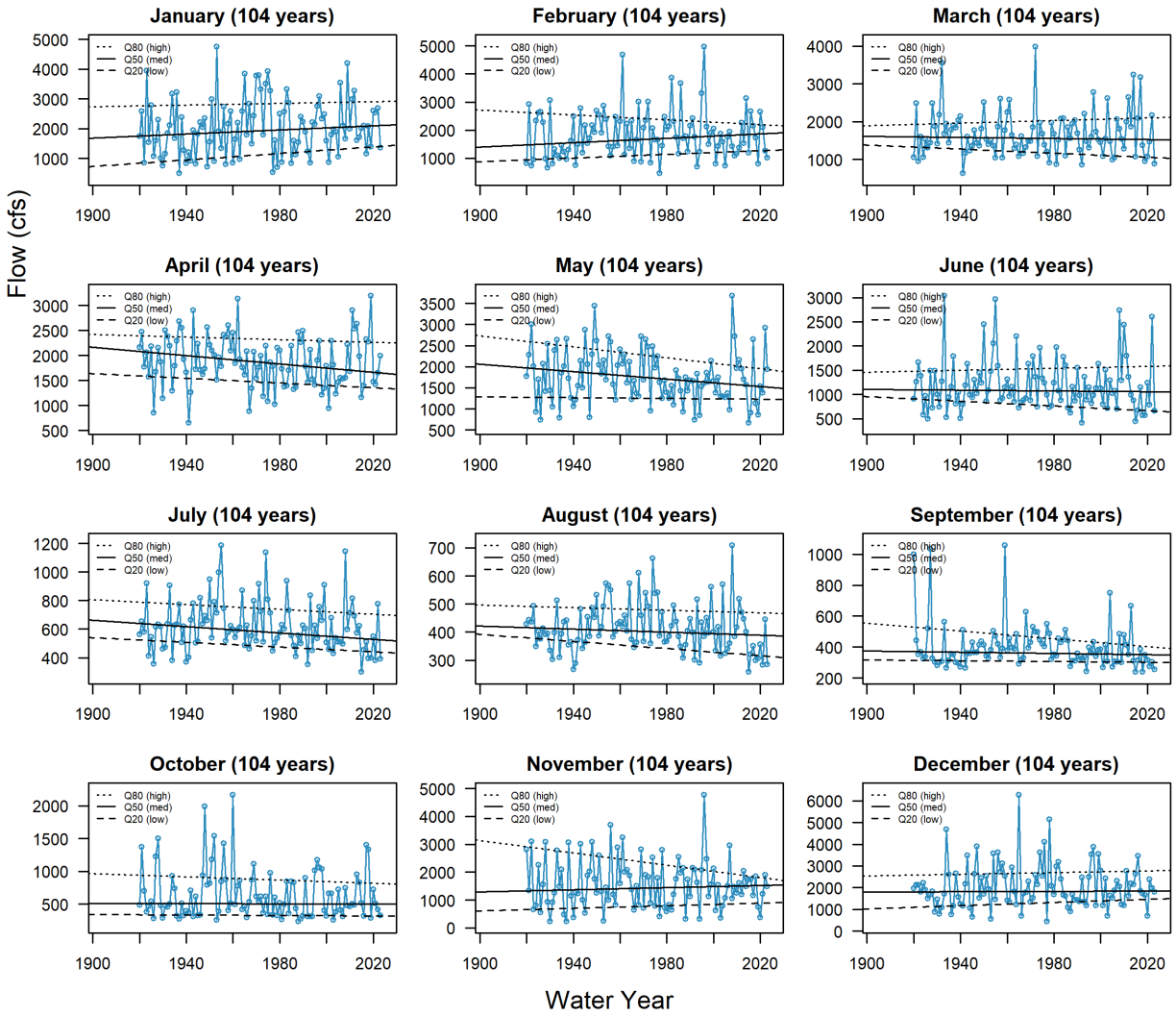
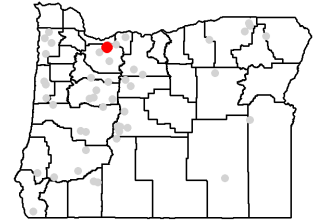


# Long-term Flow Trends for Station #14137000

Annual Flow at Station #14137000 (110 years, 1912-2023)

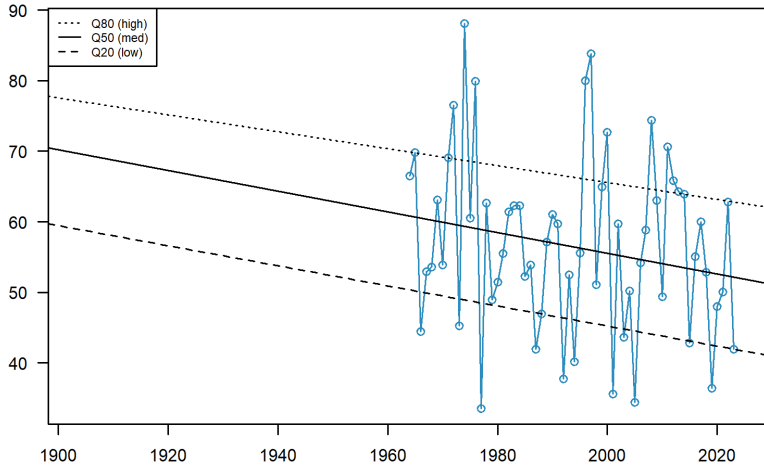


Station #14137000

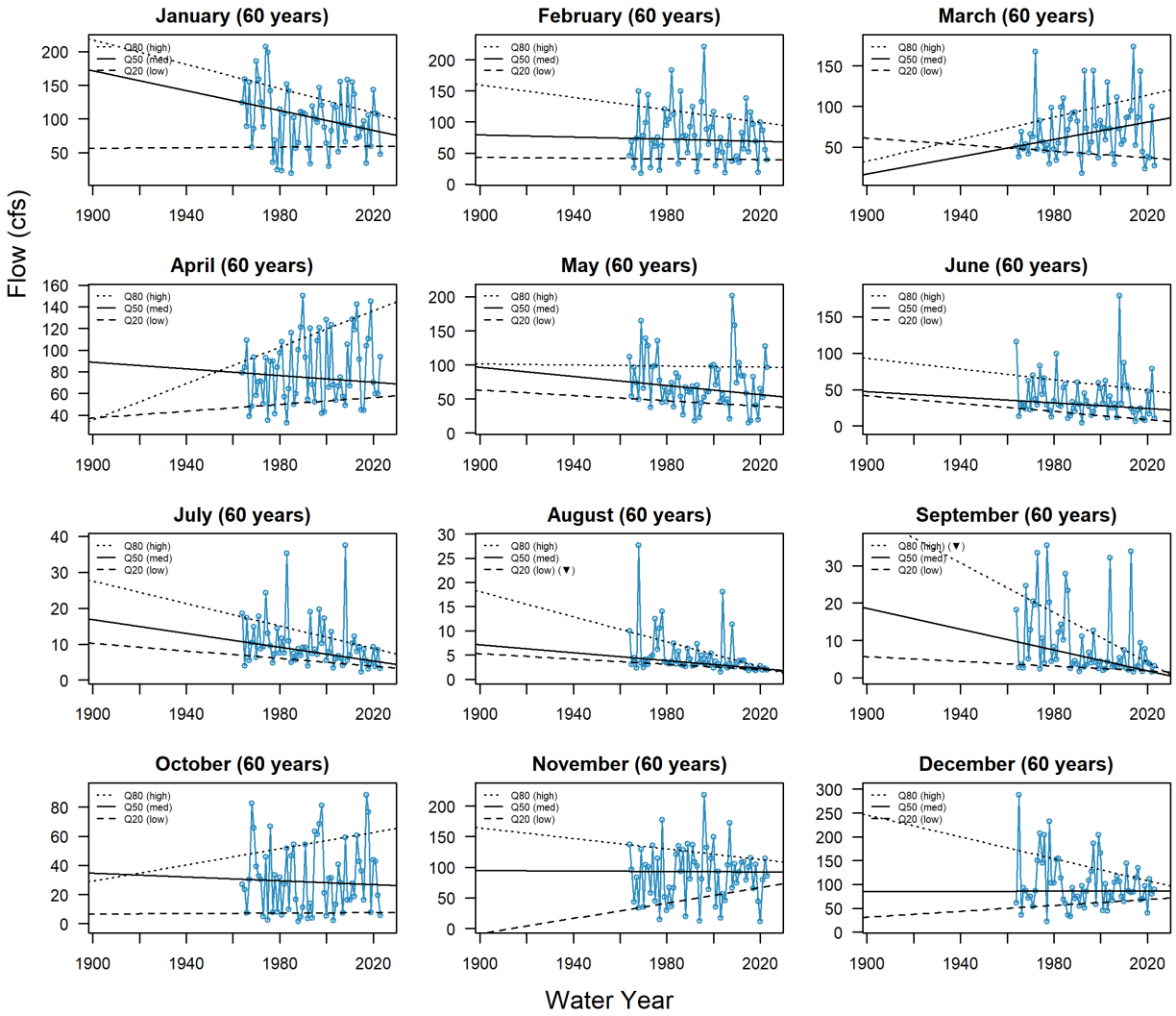
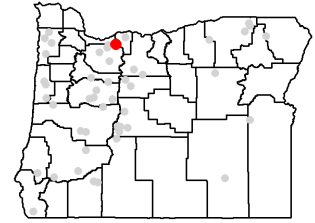


# Long-term Flow Trends for Station #14138800

## Annual Flow at Station #14138800 (60 years, 1964-2023)

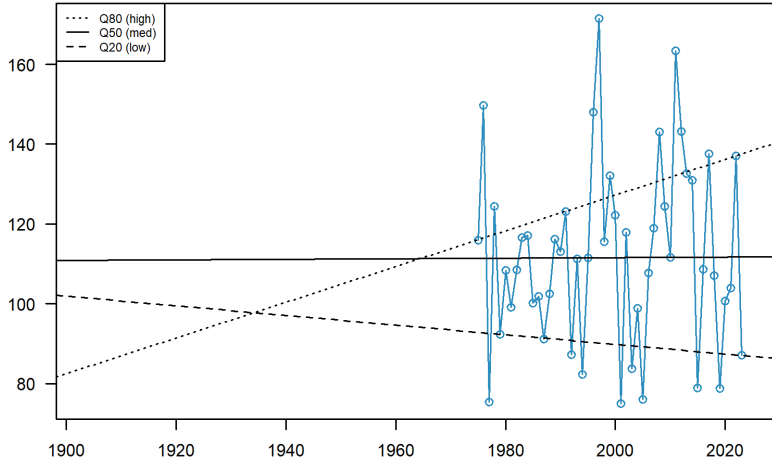


## Station #14138800

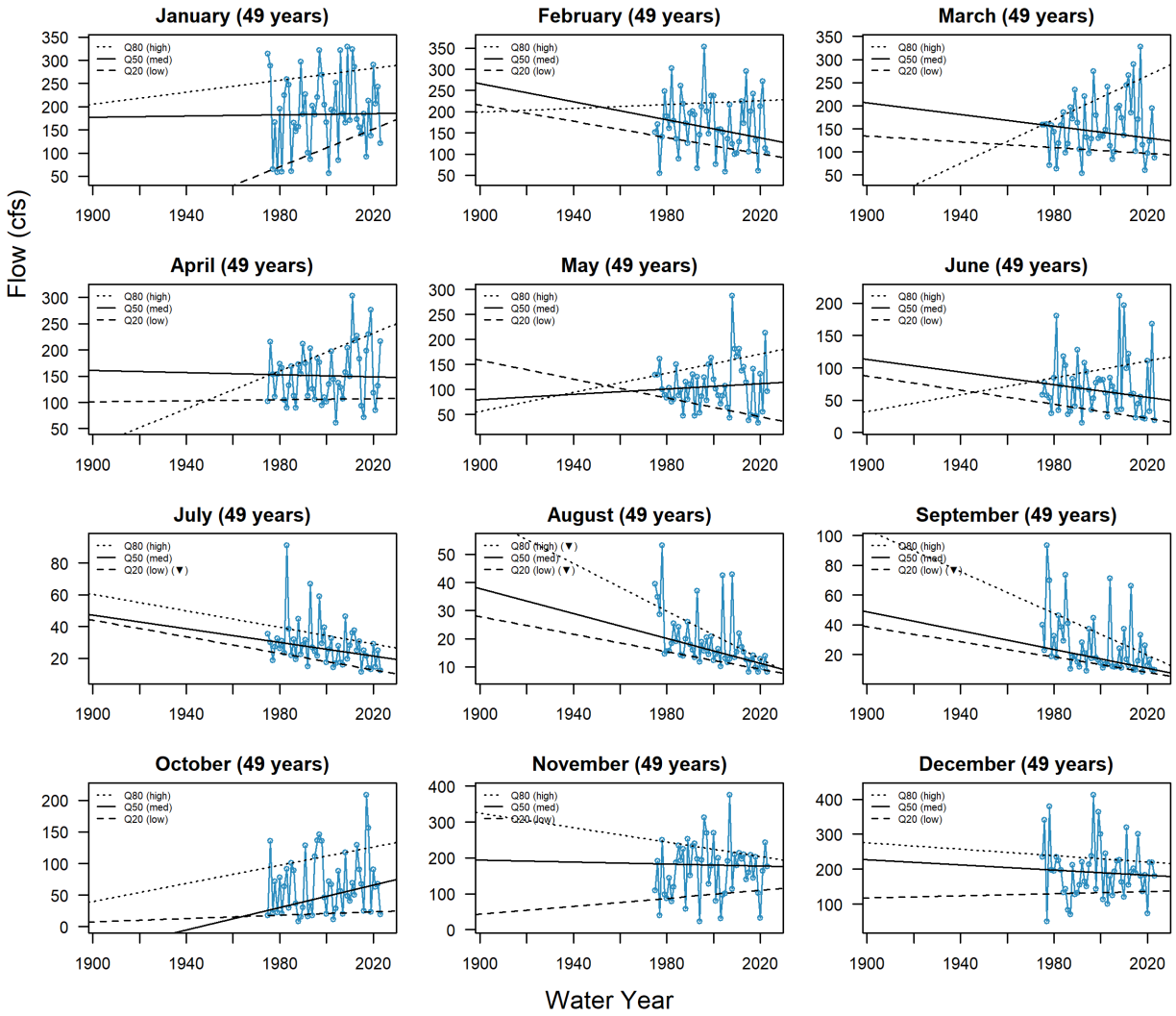
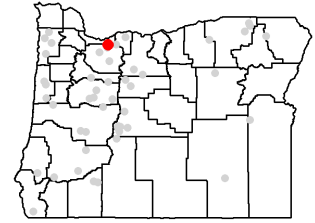


# Long-term Flow Trends for Station #14139800

Annual Flow at Station #14139800 (49 years, 1975-2023)

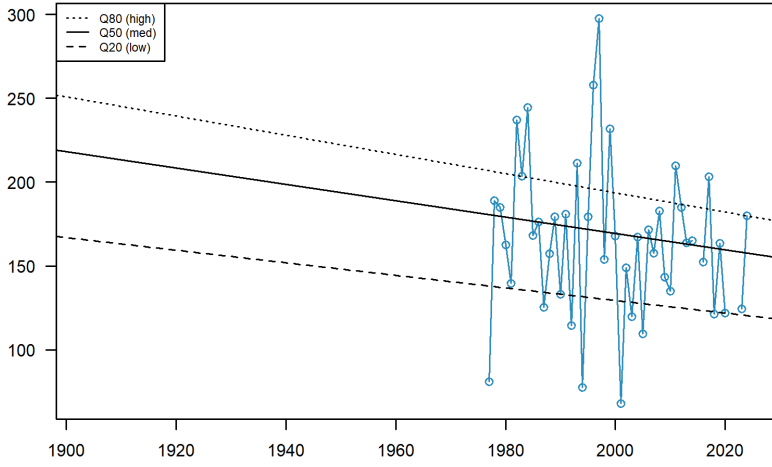


Station #14139800

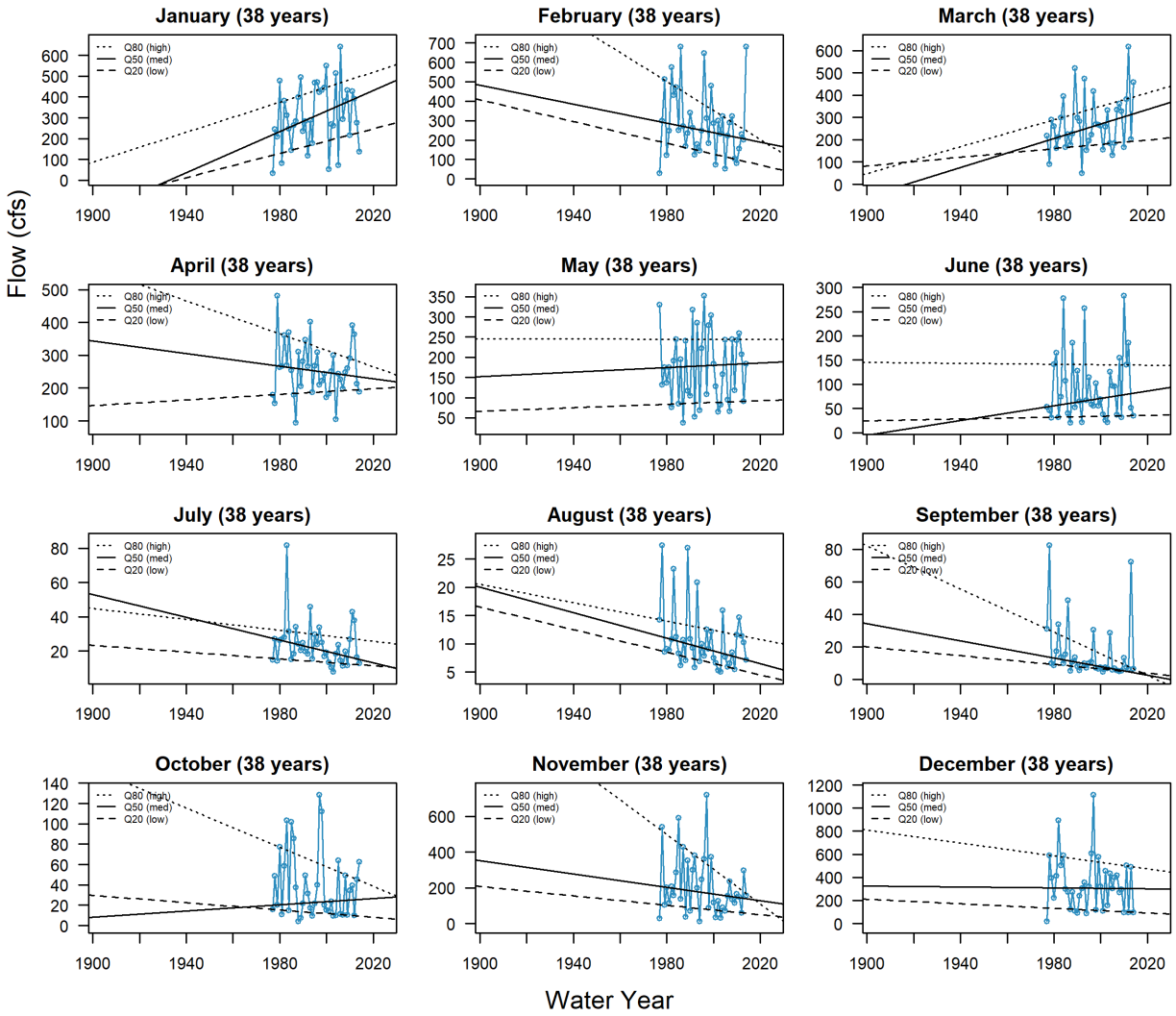
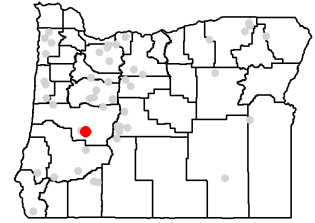


# Long-term Flow Trends for Station #14153800

Annual Flow at Station #14153800 (45 years, 1977-2024)

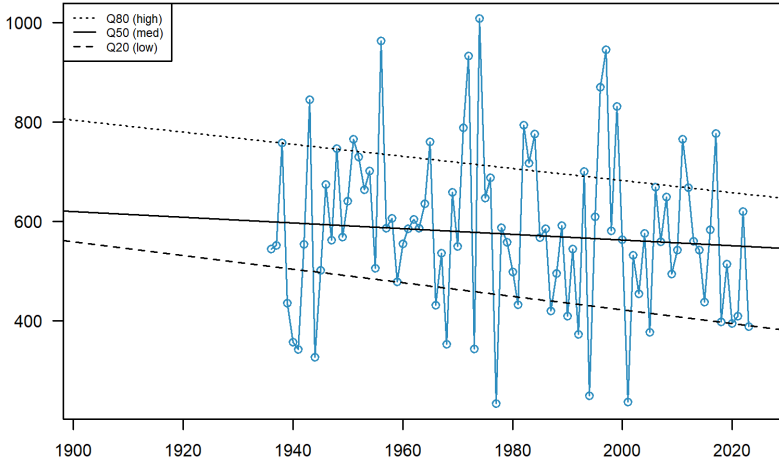


Station #14153800

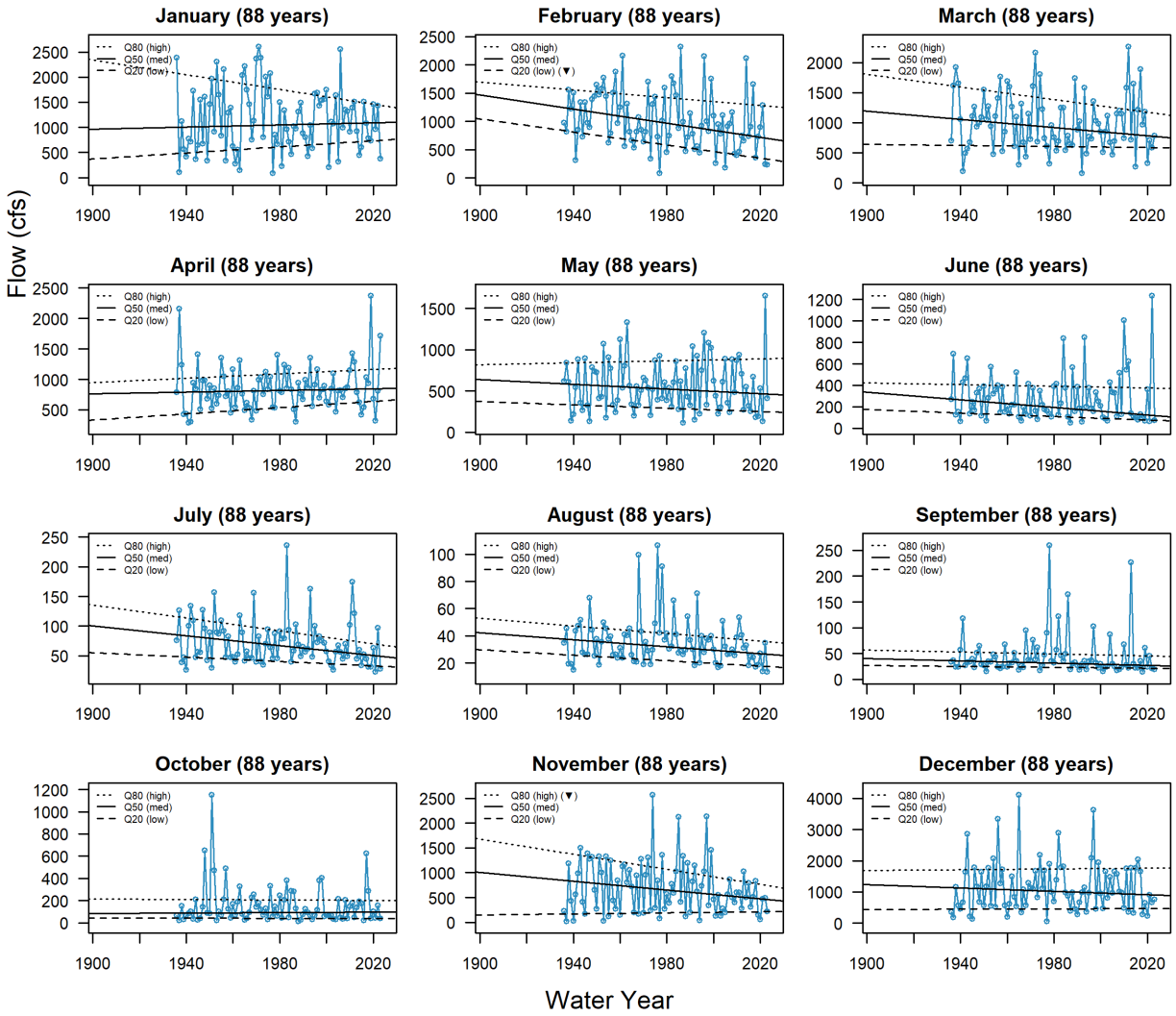
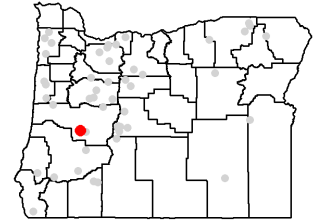


# Long-term Flow Trends for Station #14154500

Annual Flow at Station #14154500 (88 years, 1936-2023)

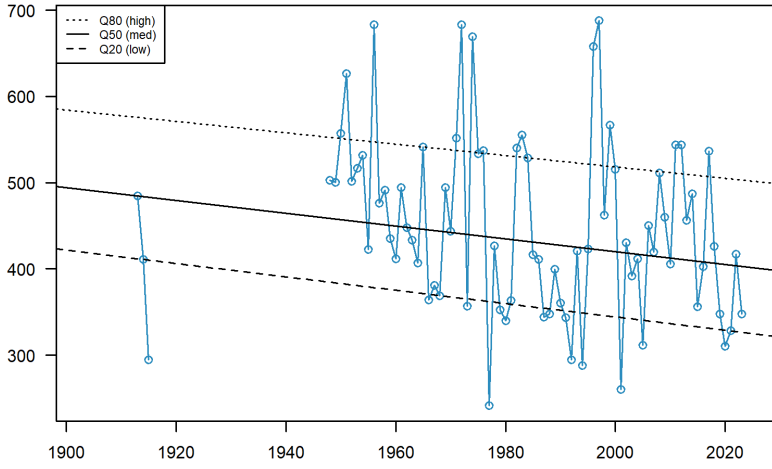


Station #14154500

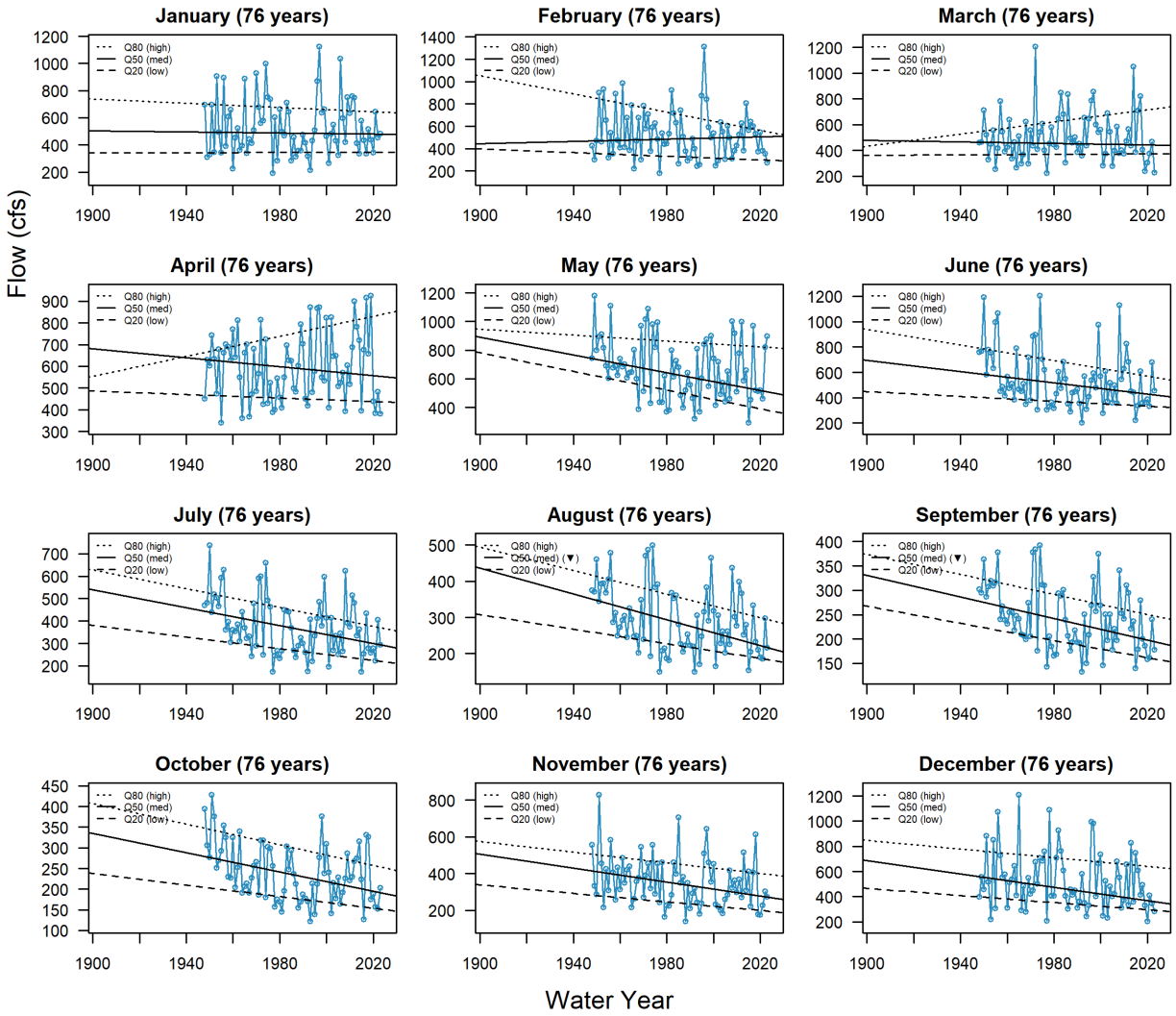
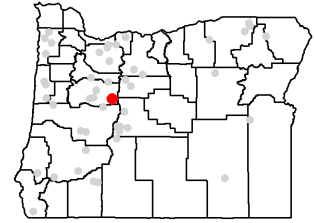


# Long-term Flow Trends for Station #14158500

Annual Flow at Station #14158500 (79 years, 1913-2023)

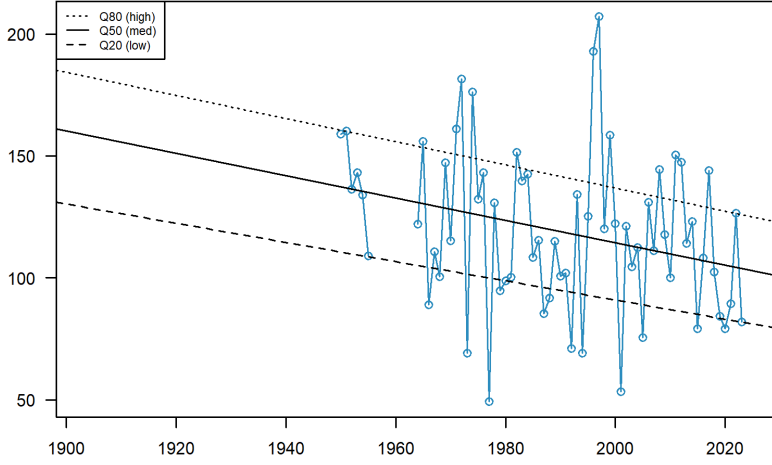


Station #14158500

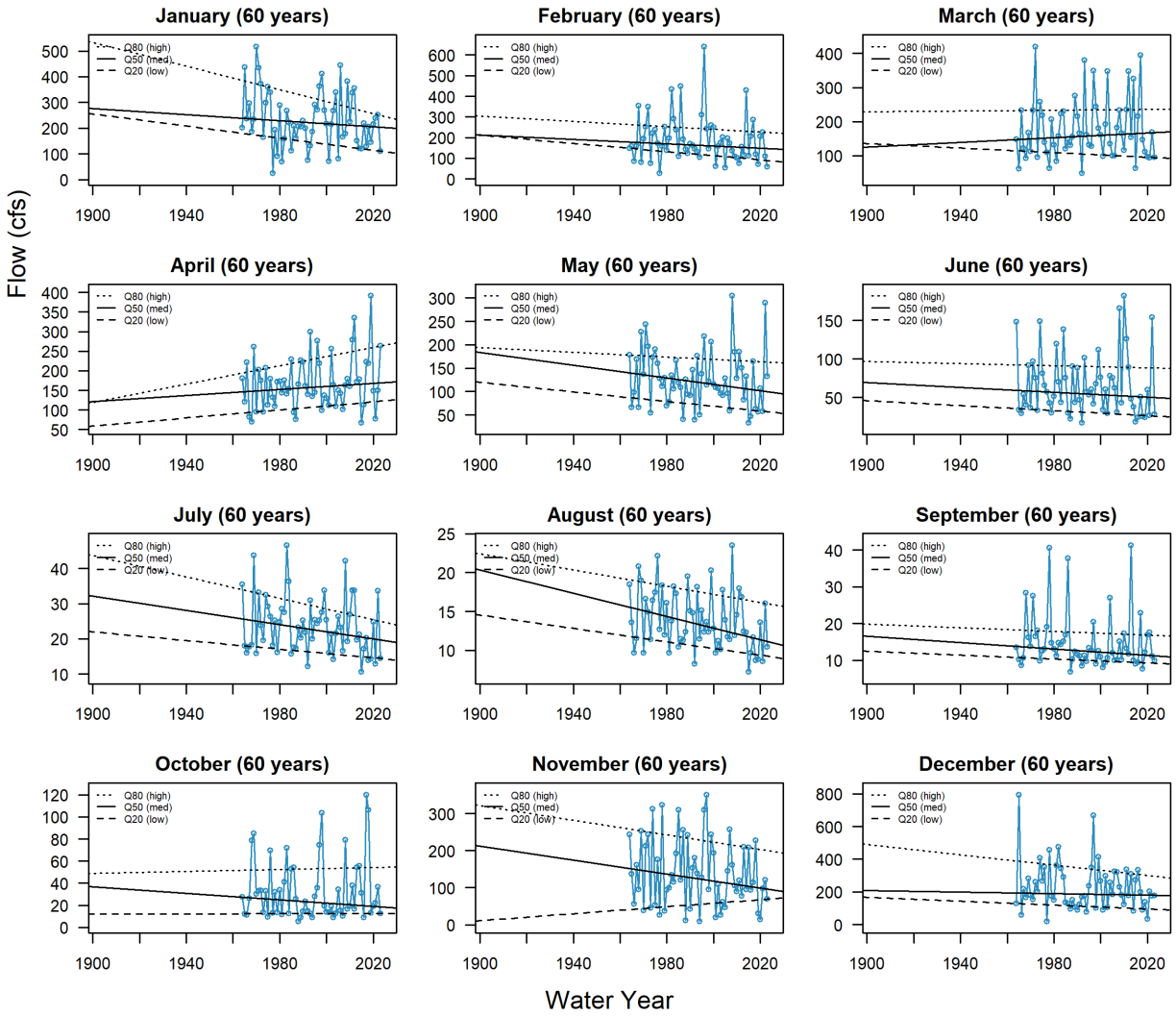
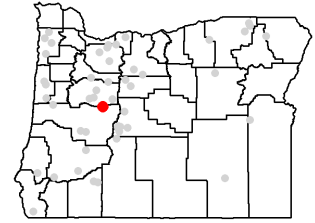


# Long-term Flow Trends for Station #14161500

## Annual Flow at Station #14161500 (66 years, 1950-2023)

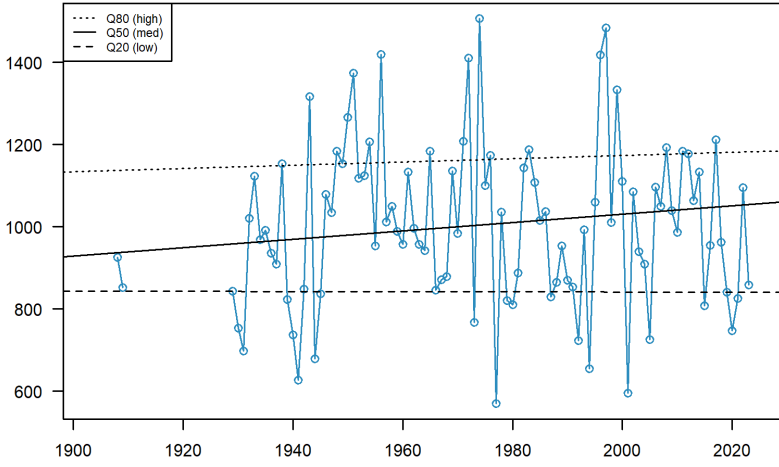


## Station #14161500

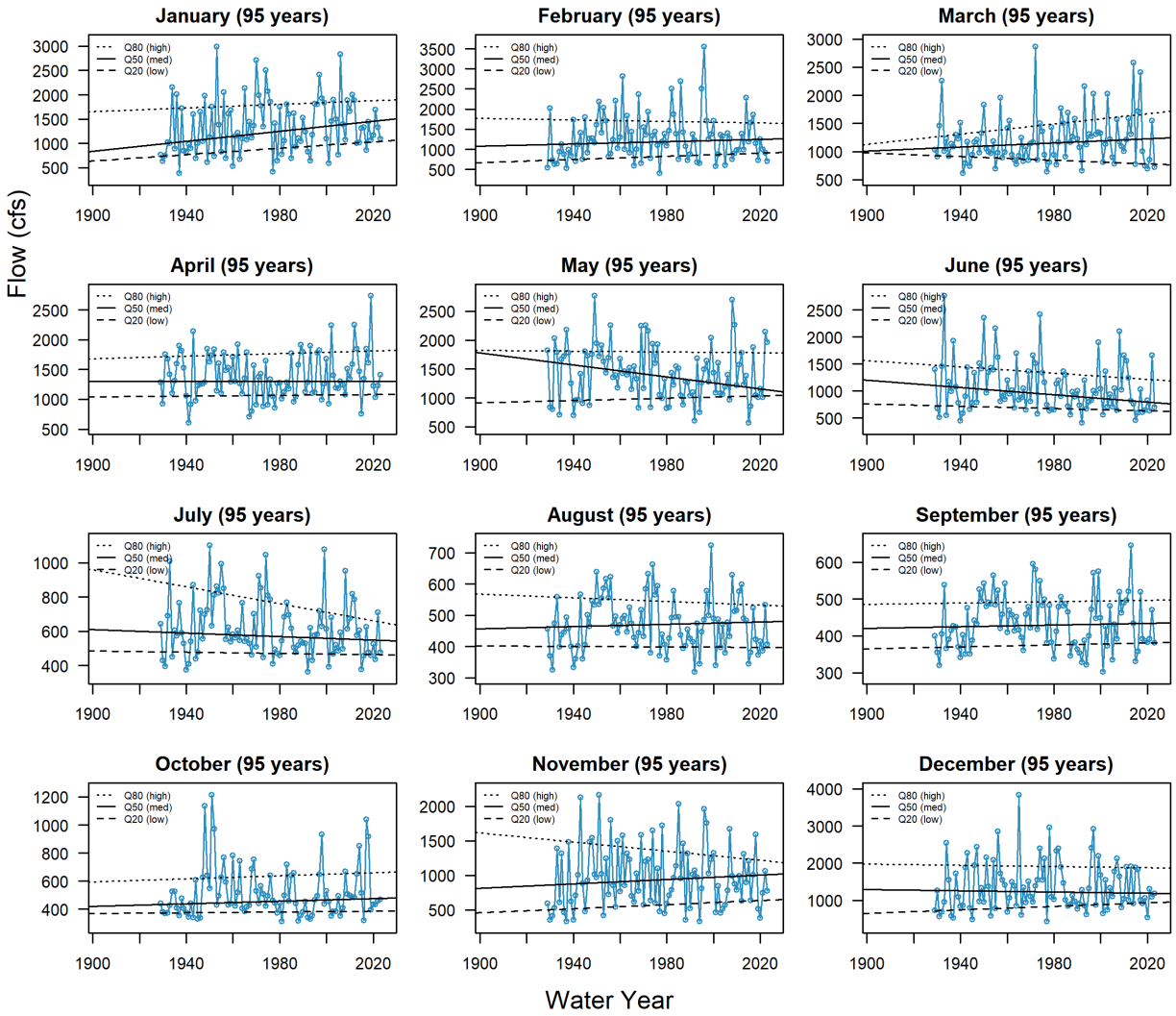
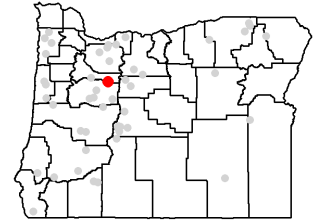


# Long-term Flow Trends for Station #14178000

Annual Flow at Station #14178000 (97 years, 1908-2023)

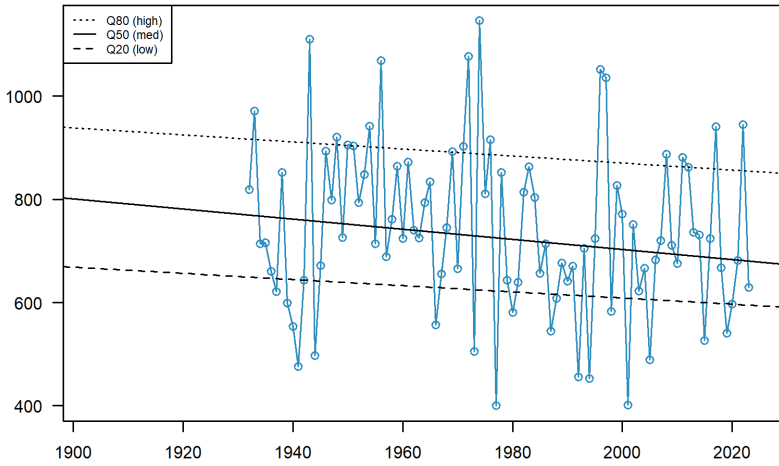


Station #14178000

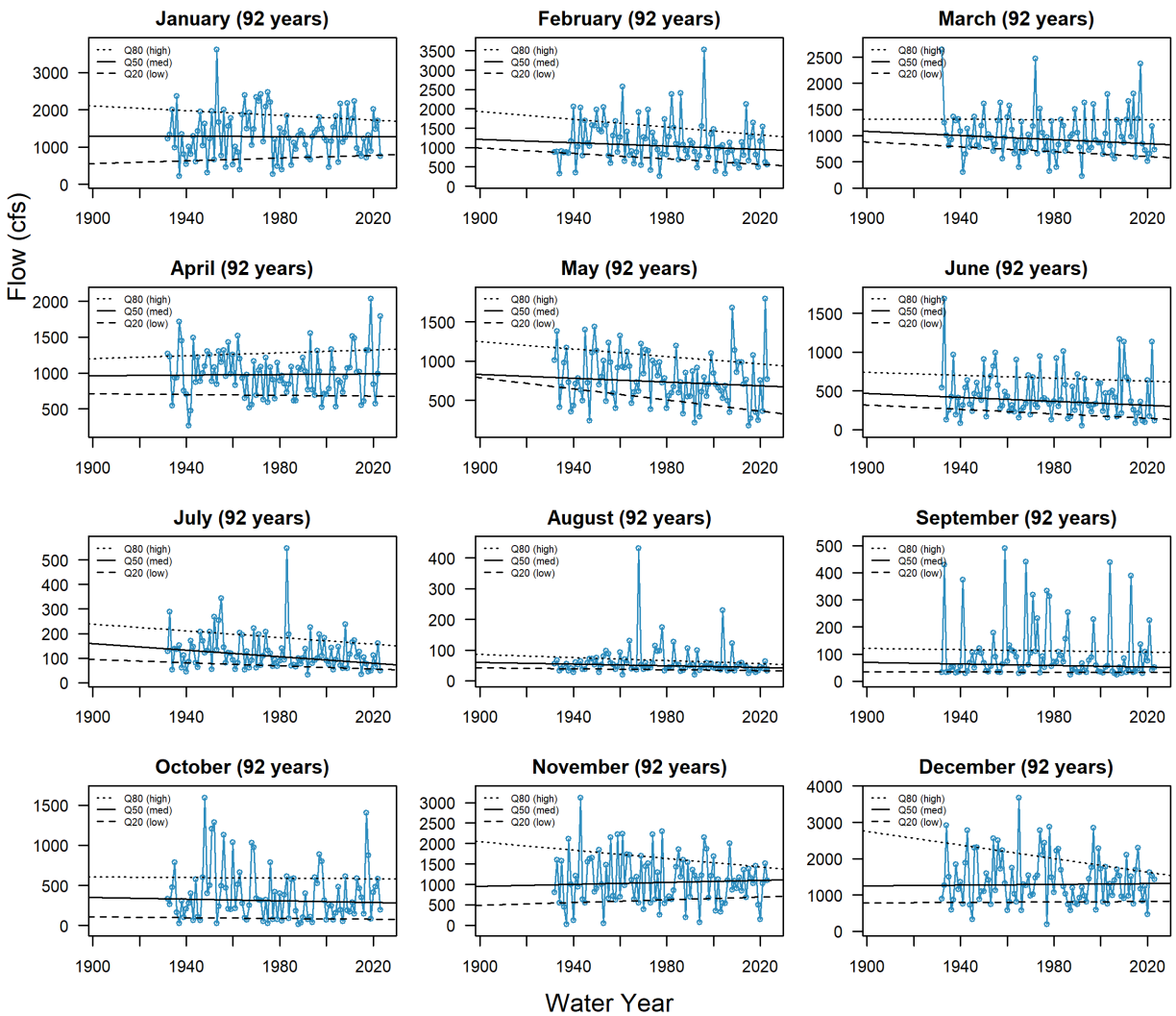
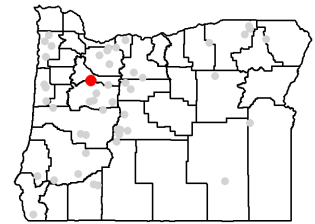


# Long-term Flow Trends for Station #14182500

## Annual Flow at Station #14182500 (92 years, 1932-2023)

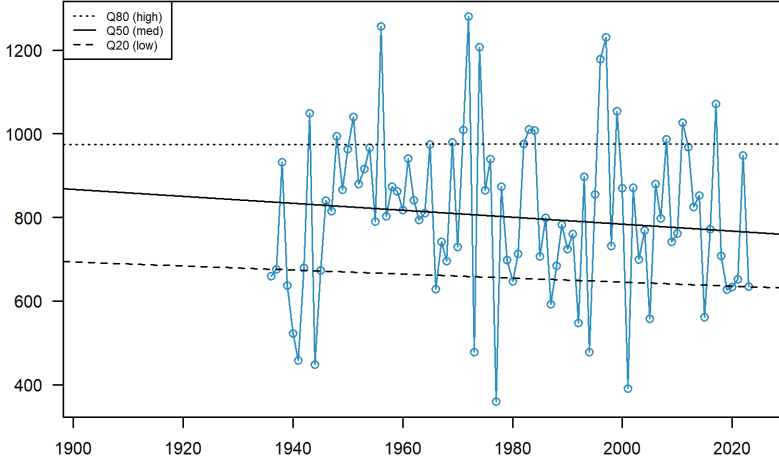


## Station #14182500

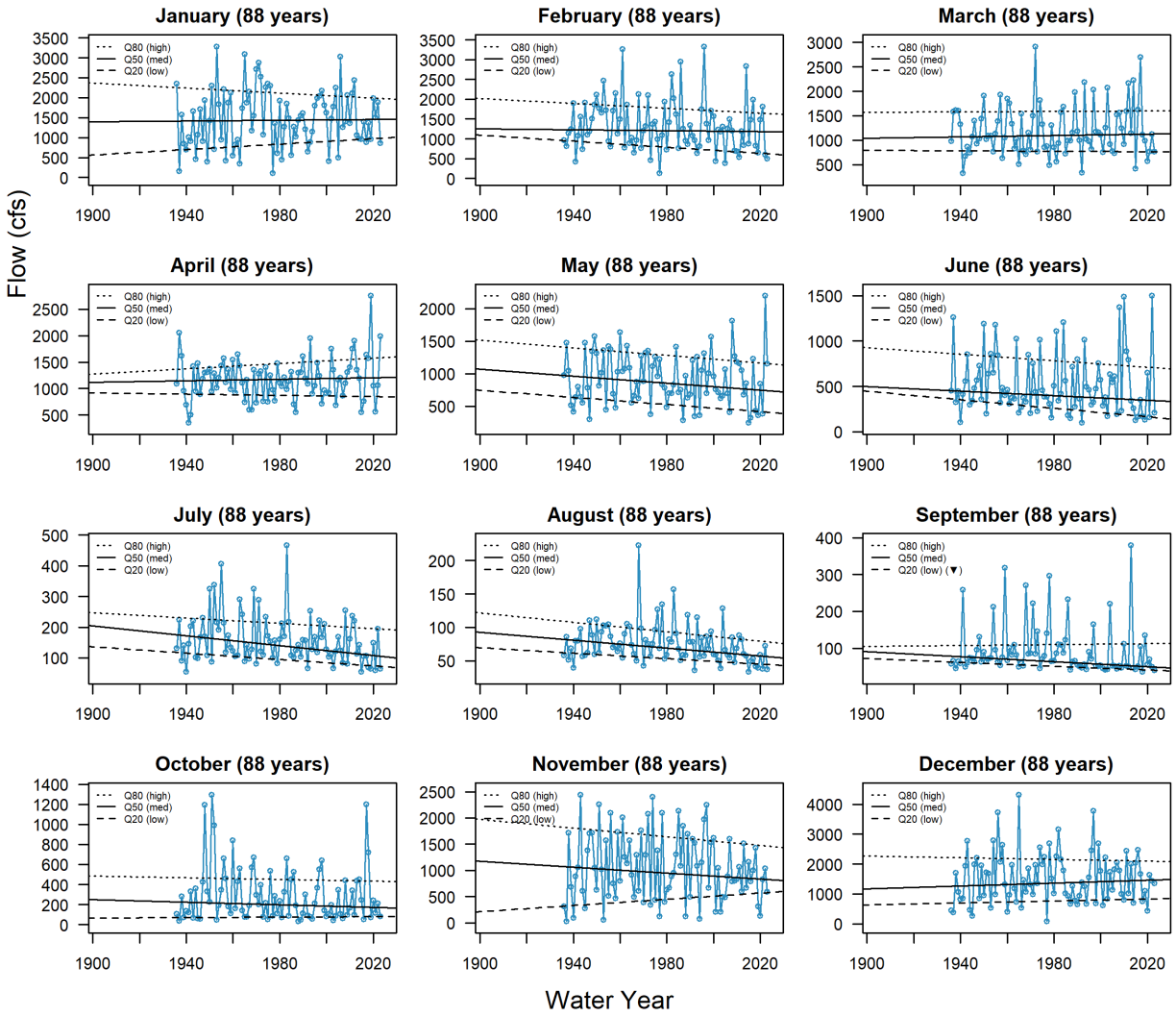
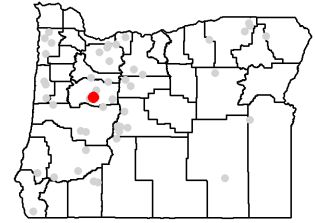


# Long-term Flow Trends for Station #14185000

Annual Flow at Station #14185000 (88 years, 1936-2023)

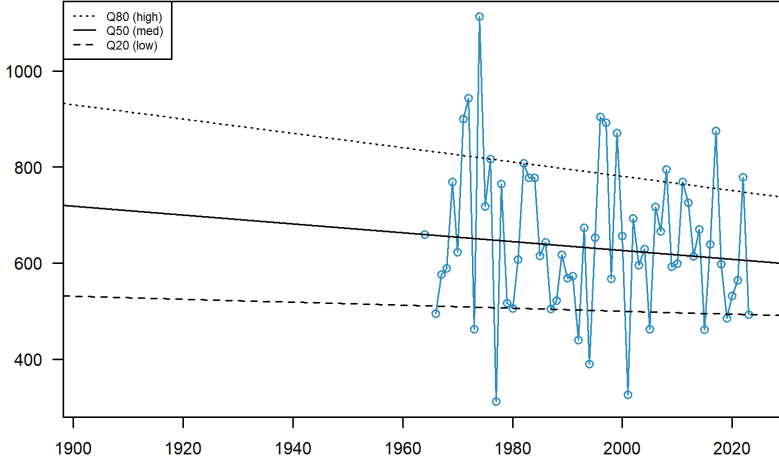


Station #14185000

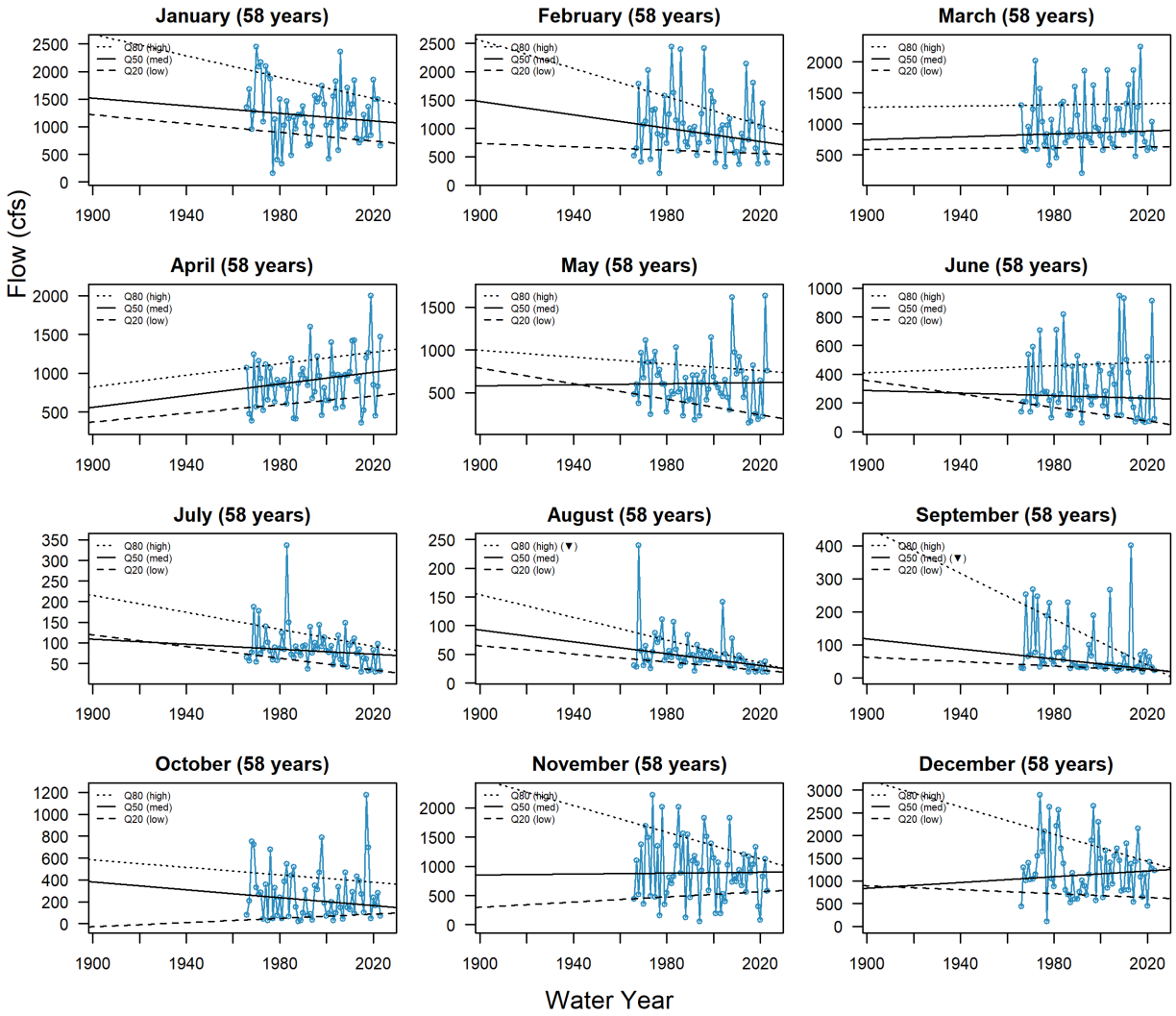
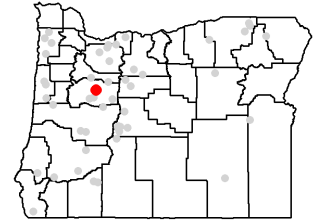


# Long-term Flow Trends for Station #14185900

Annual Flow at Station #14185900 (59 years, 1964-2023)

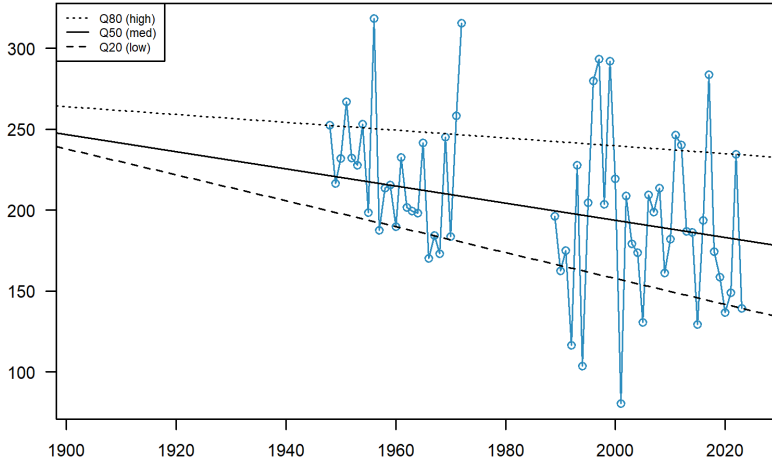


Station #14185900

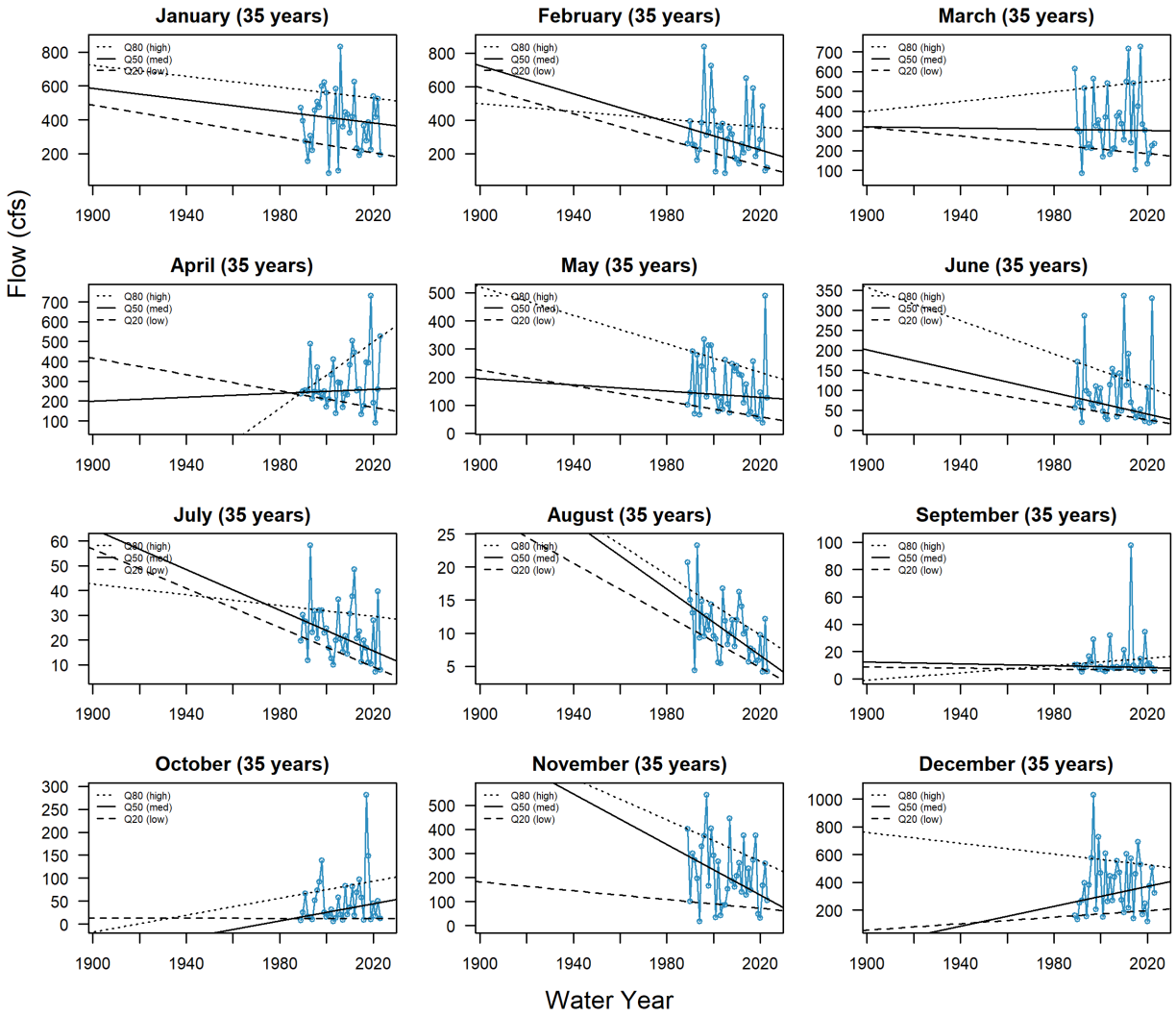
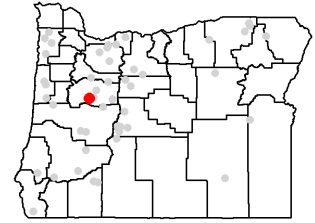


# Long-term Flow Trends for Station #14187000

## Annual Flow at Station #14187000 (60 years, 1948-2023)

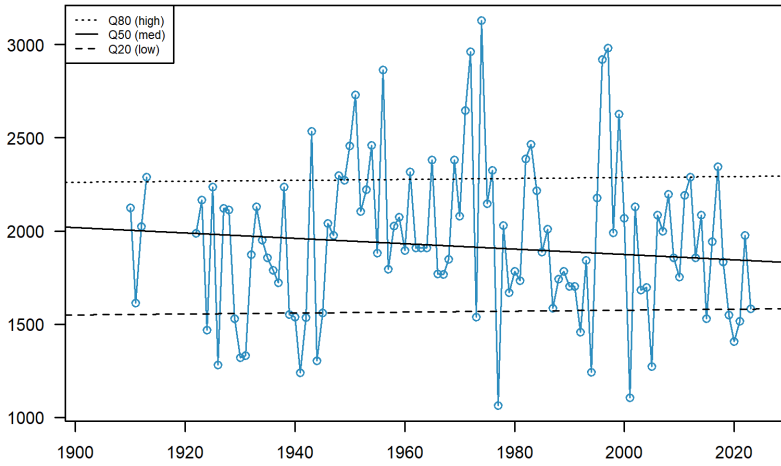


## Station #14187000

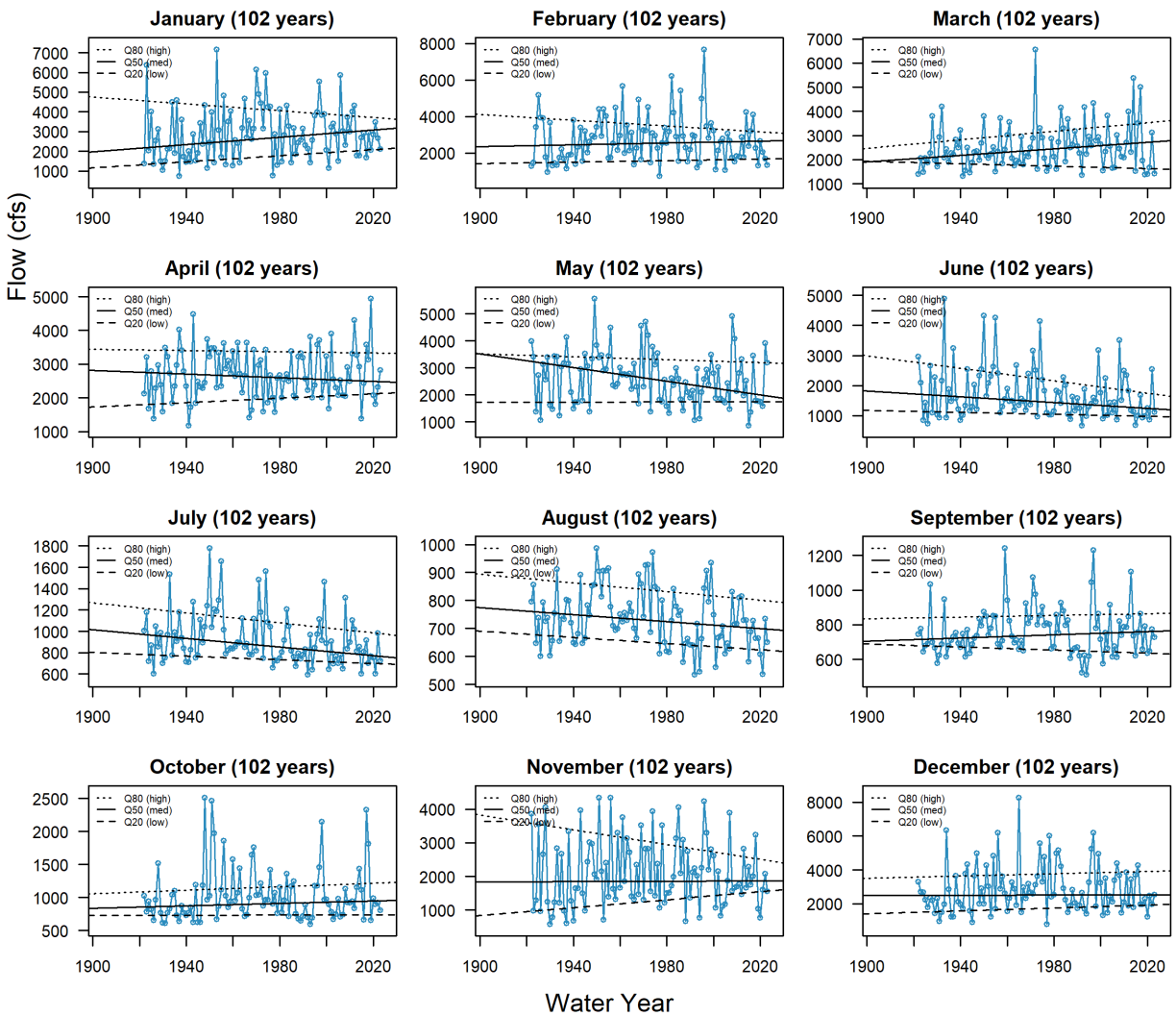
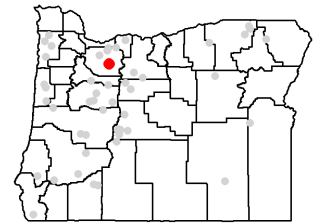


# Long-term Flow Trends for Station #14209500

## Annual Flow at Station #14209500 (106 years, 1910-2023)

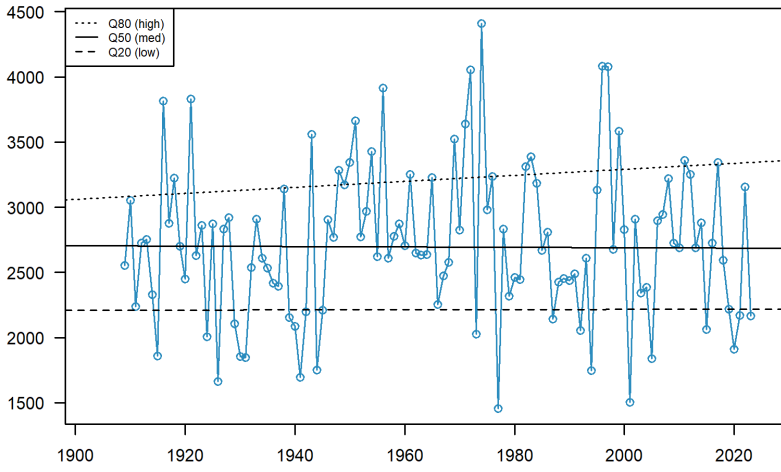


## Station #14209500

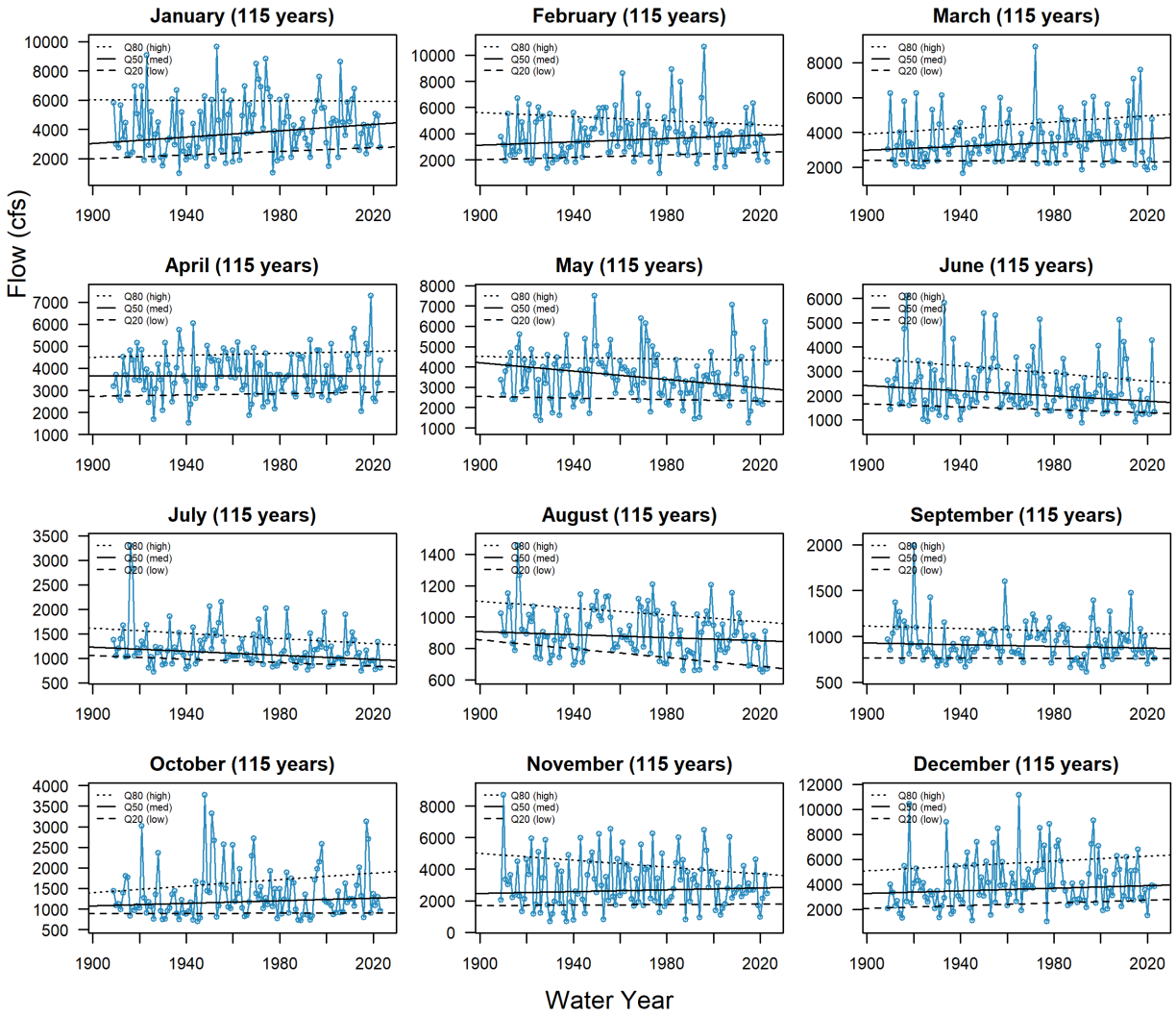
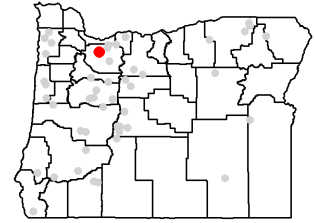


# Long-term Flow Trends for Station #14210000

Annual Flow at Station #14210000 (115 years, 1909-2023)

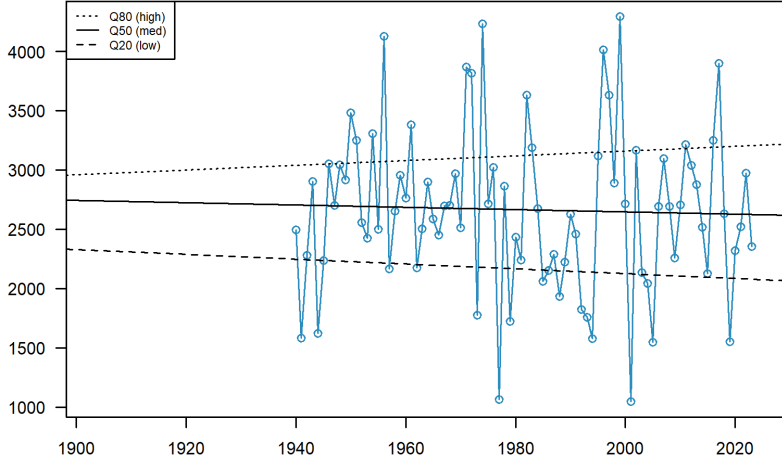


Station #14210000

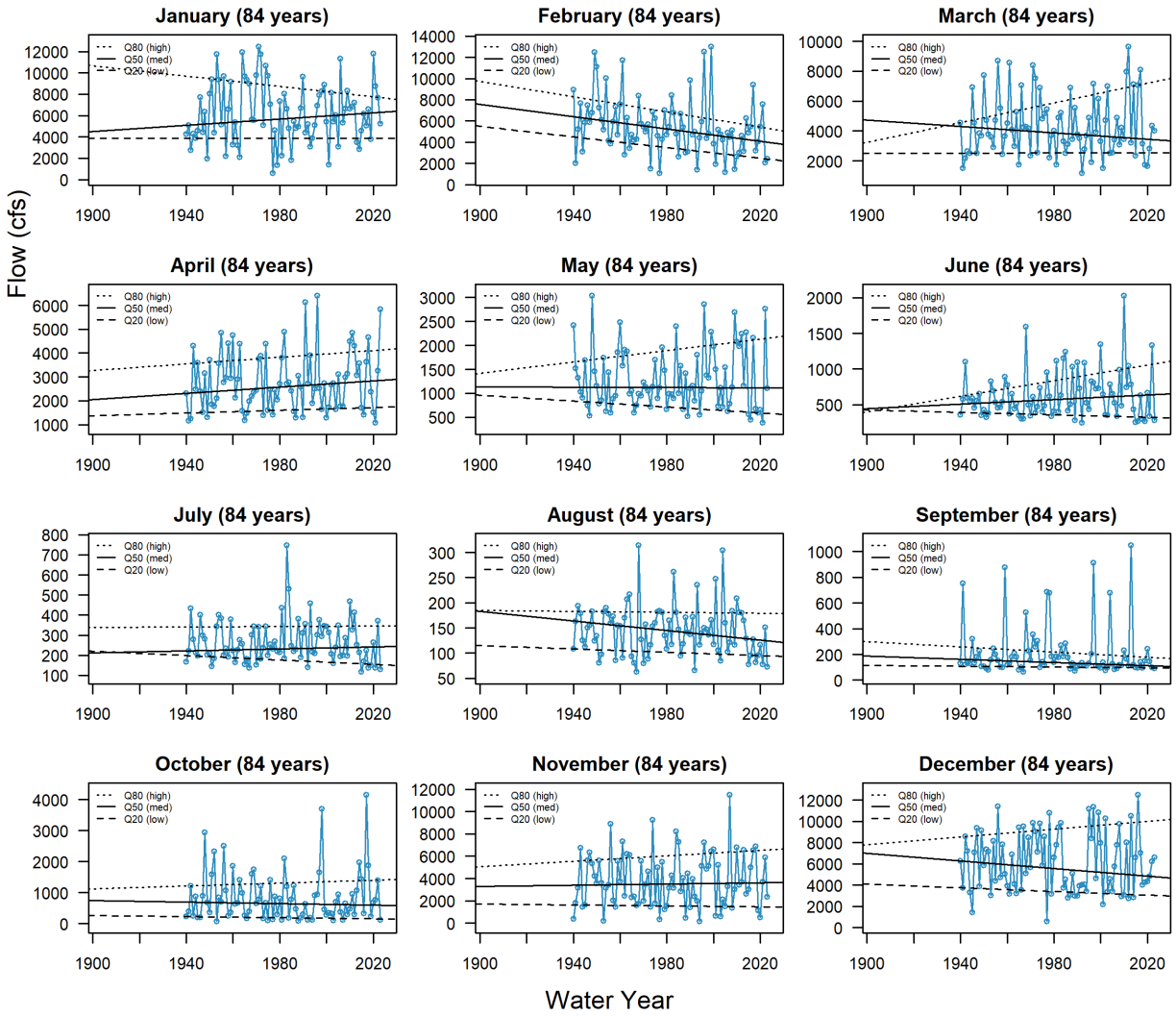
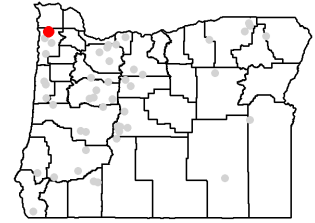


# Long-term Flow Trends for Station #14301000

Annual Flow at Station #14301000 (84 years, 1940-2023)

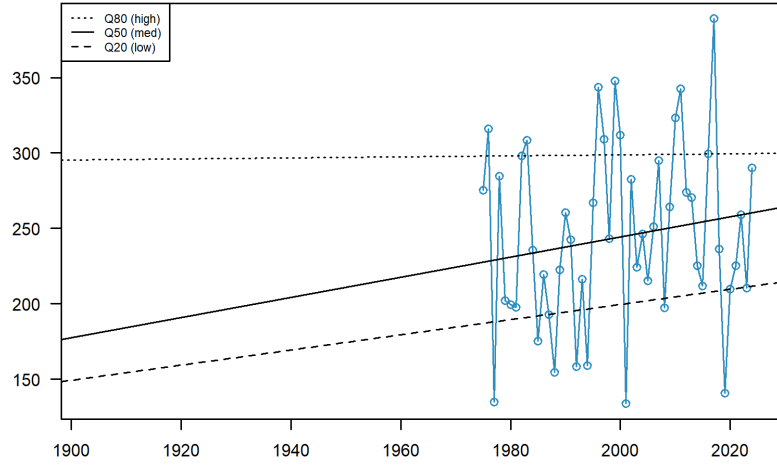


Station #14301000

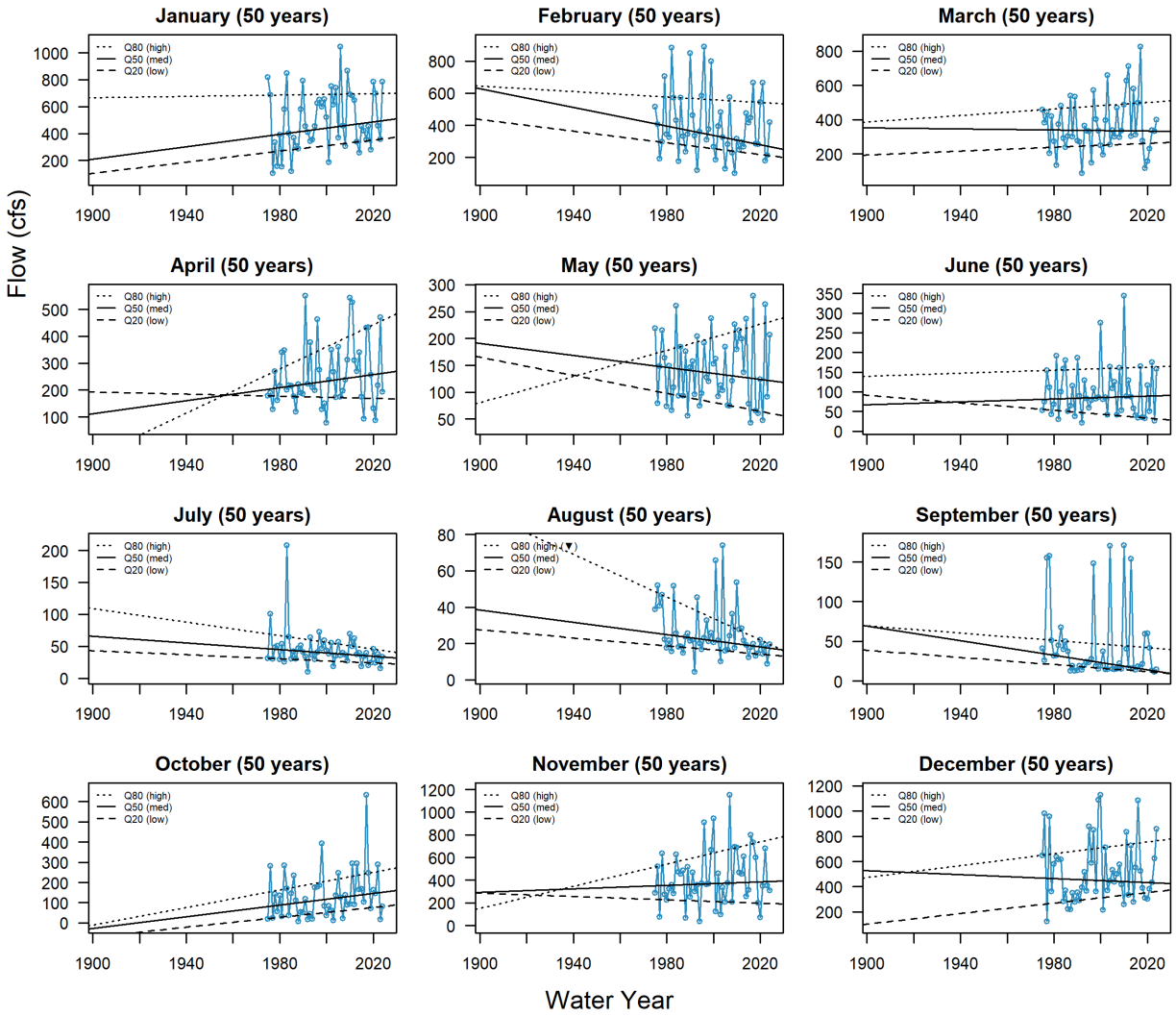
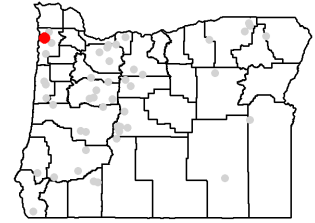


# Long-term Flow Trends for Station #14301300

Annual Flow at Station #14301300 (50 years, 1975-2024)

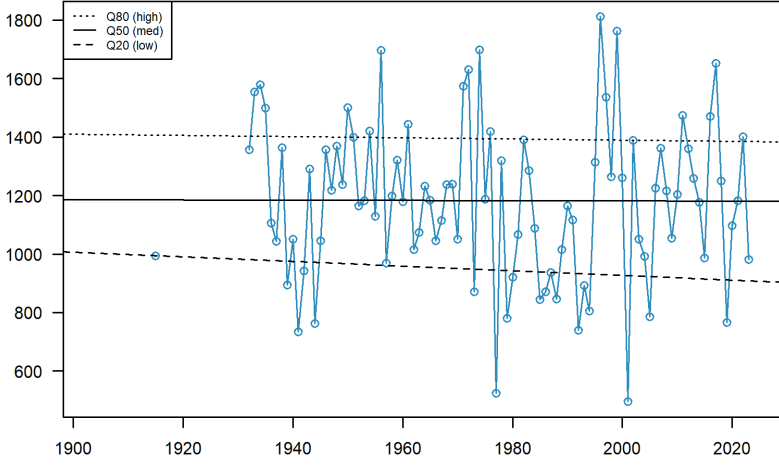


Station #14301300

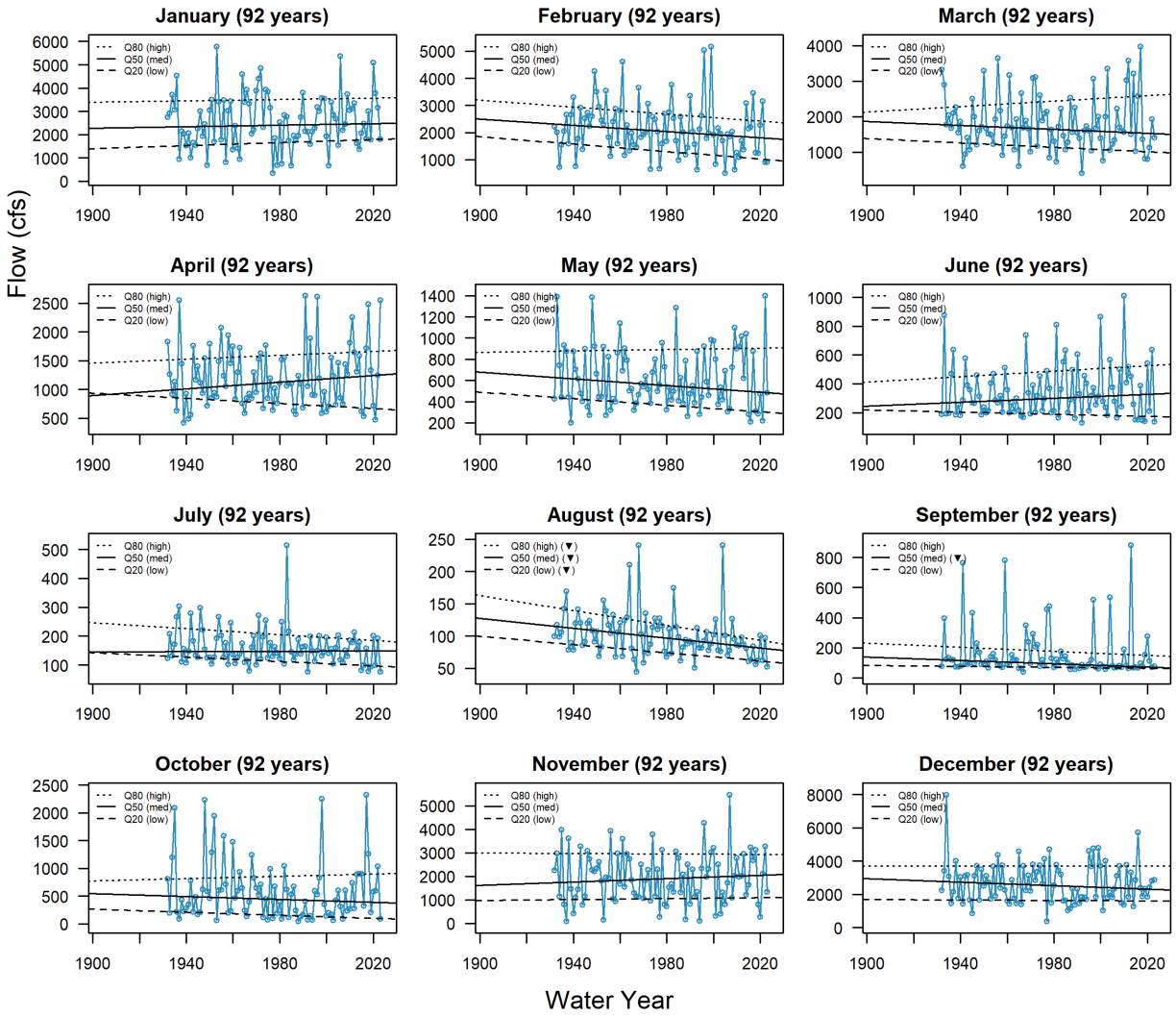
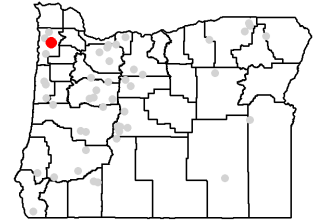


# Long-term Flow Trends for Station #14301500

Annual Flow at Station #14301500 (93 years, 1915-2023)

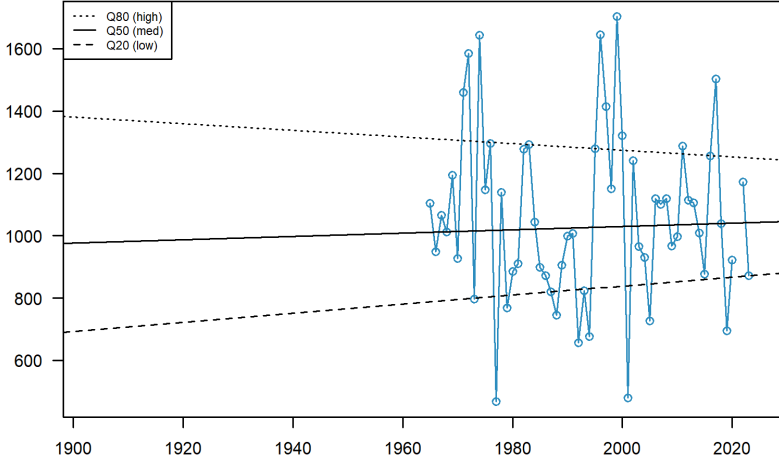


Station #14301500

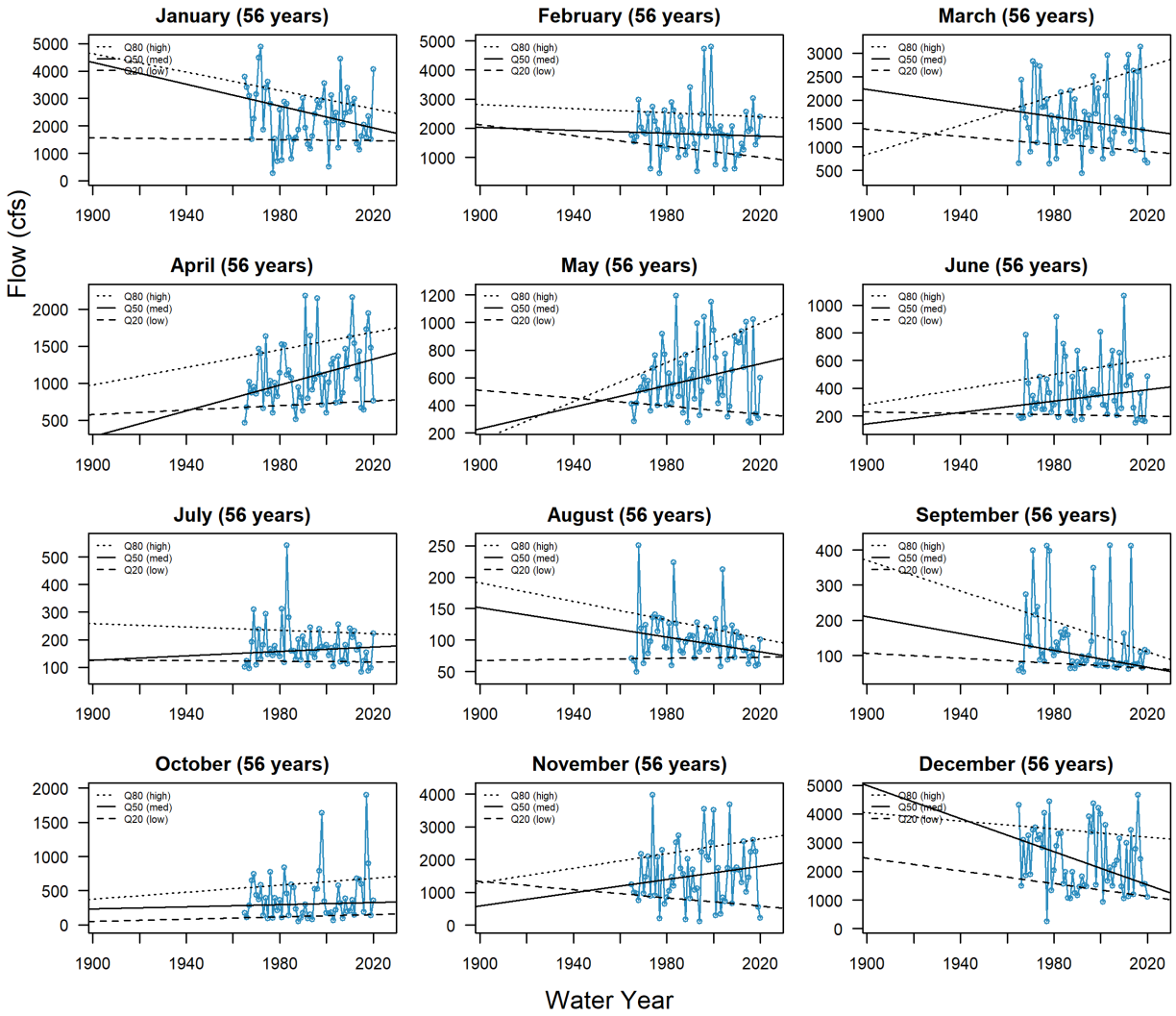
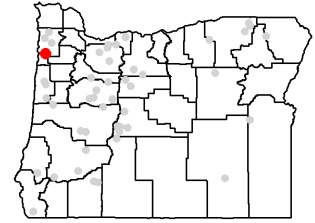


# Long-term Flow Trends for Station #14303600

Annual Flow at Station #14303600 (58 years, 1965-2023)

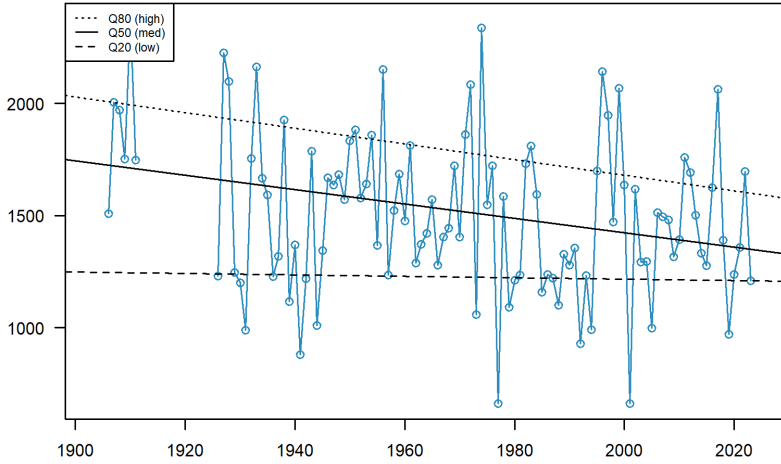


Station #14303600

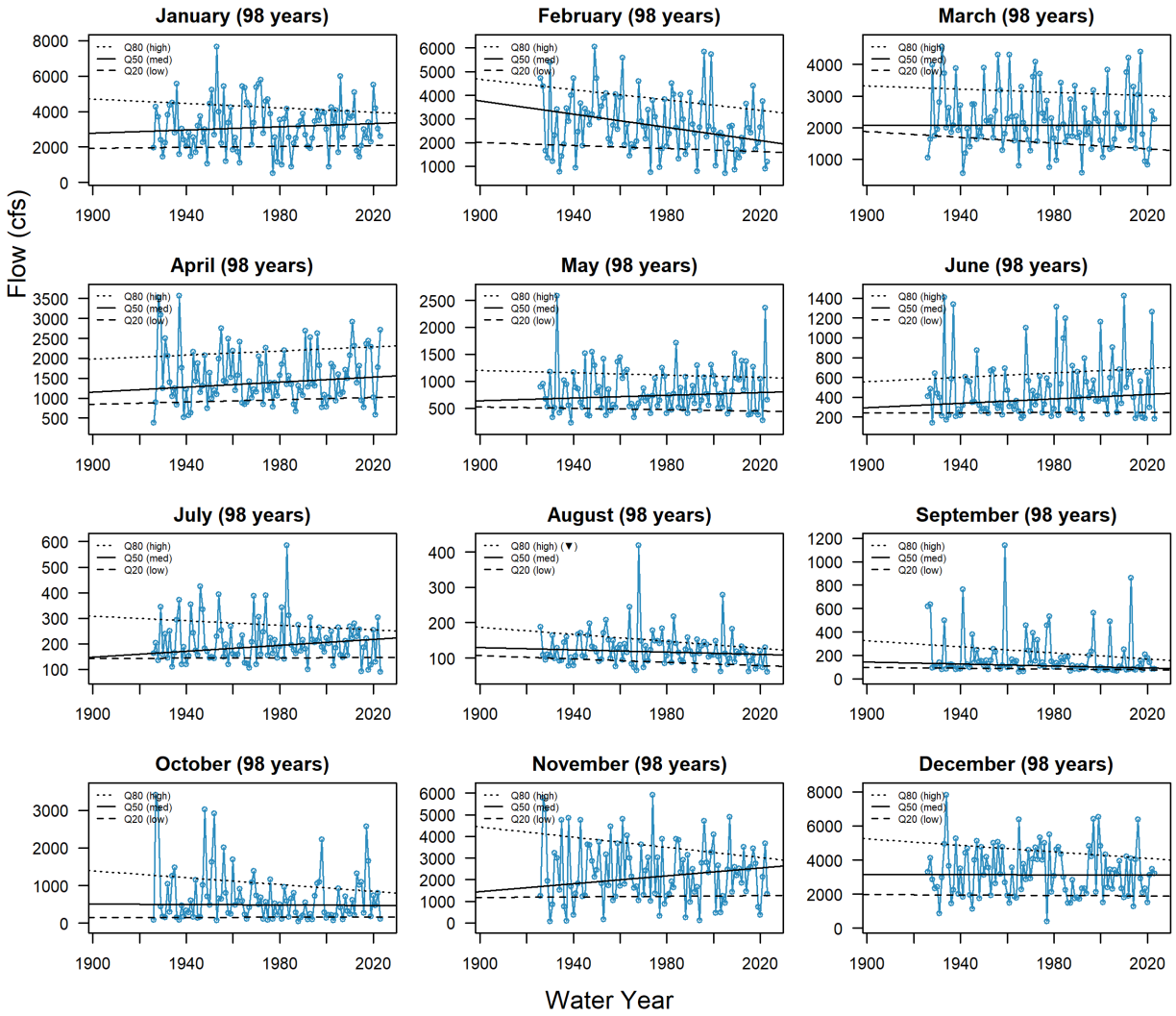
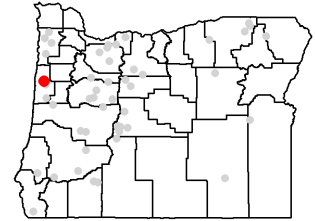


# Long-term Flow Trends for Station #14305500

Annual Flow at Station #14305500 (104 years, 1906-2023)

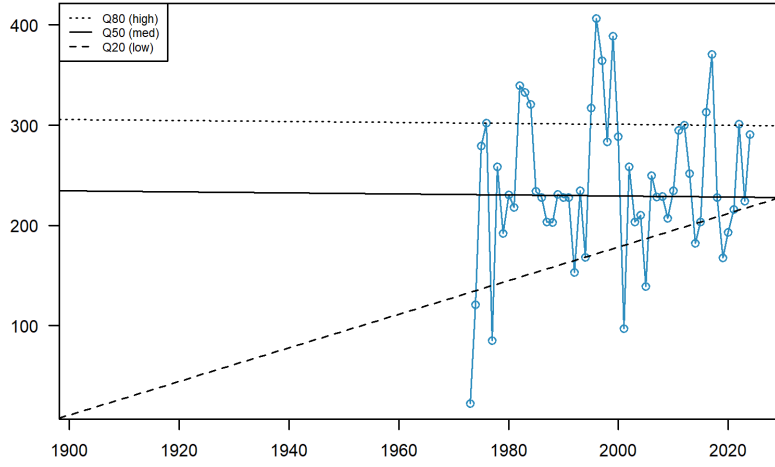


Station #14305500

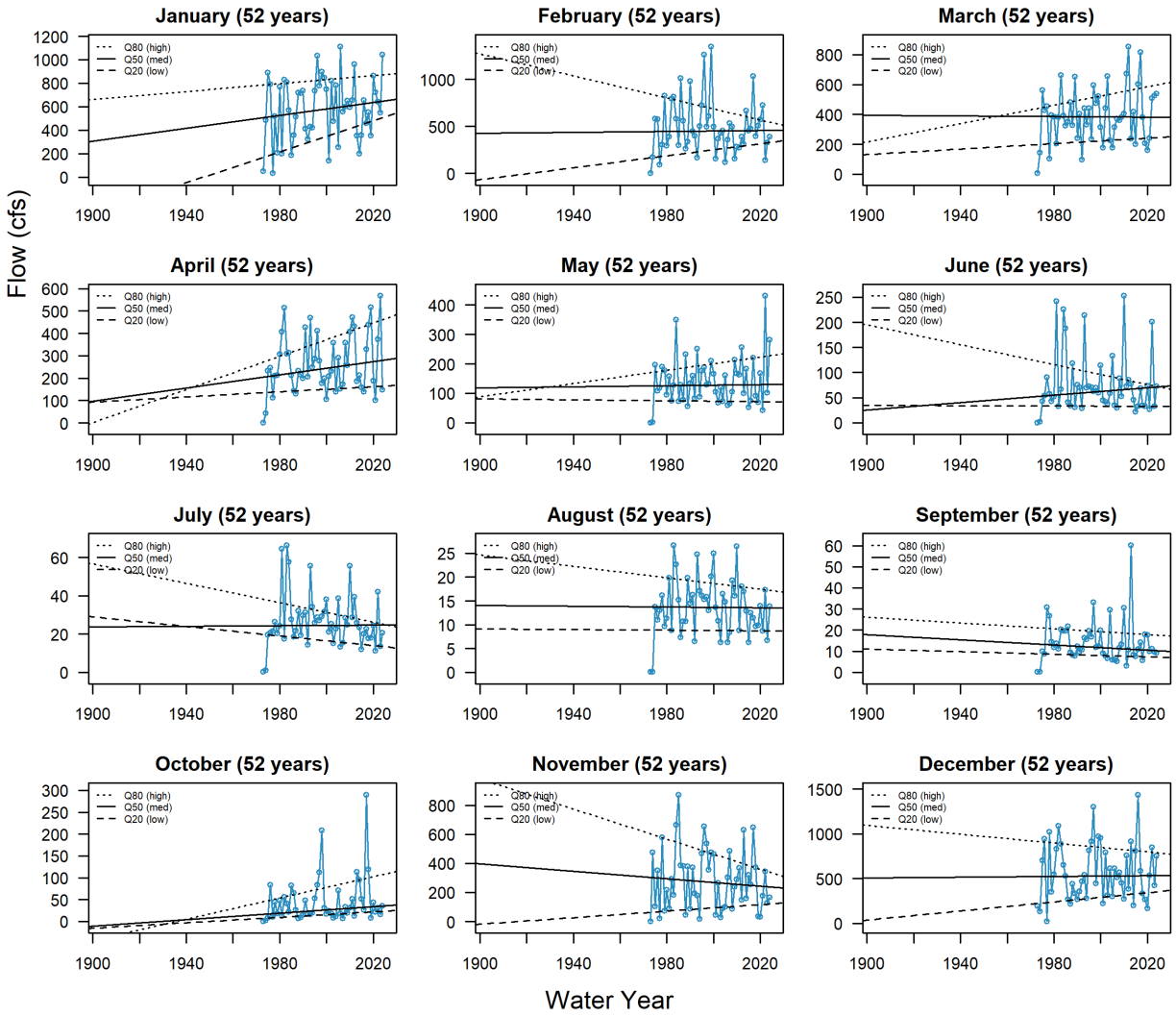
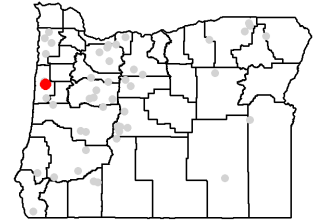


# Long-term Flow Trends for Station #14306030

Annual Flow at Station #14306030 (52 years, 1973-2024)

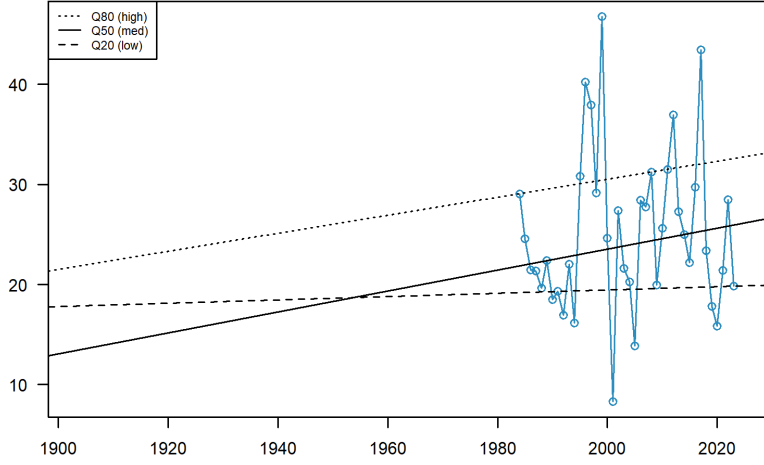


Station #14306030

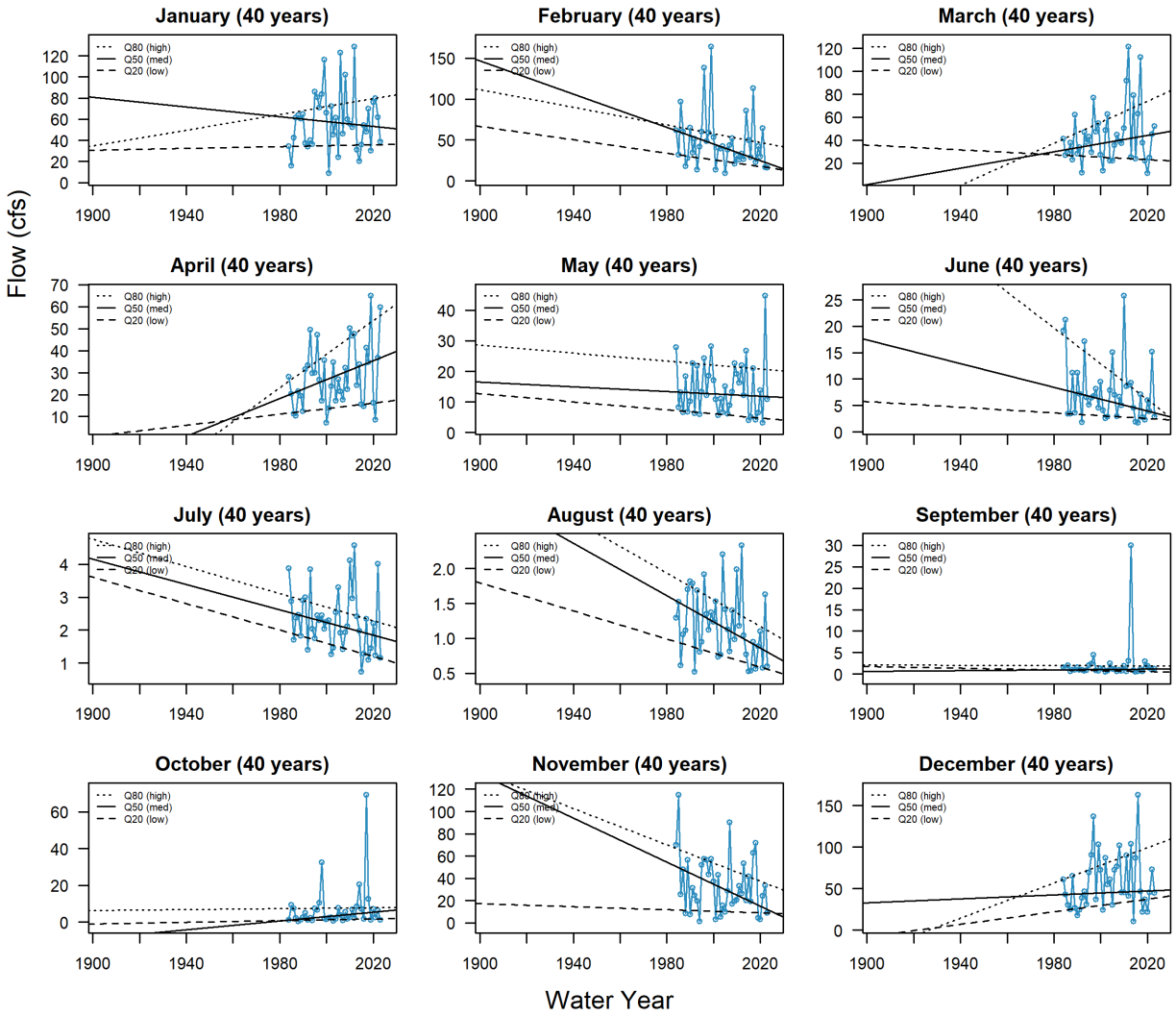
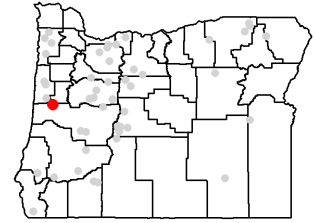


# Long-term Flow Trends for Station #14306340

Annual Flow at Station #14306340 (40 years, 1984-2023)

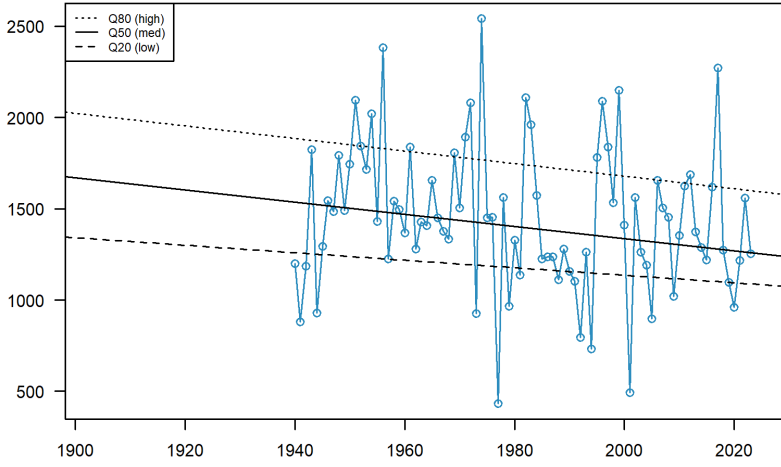


Station #14306340

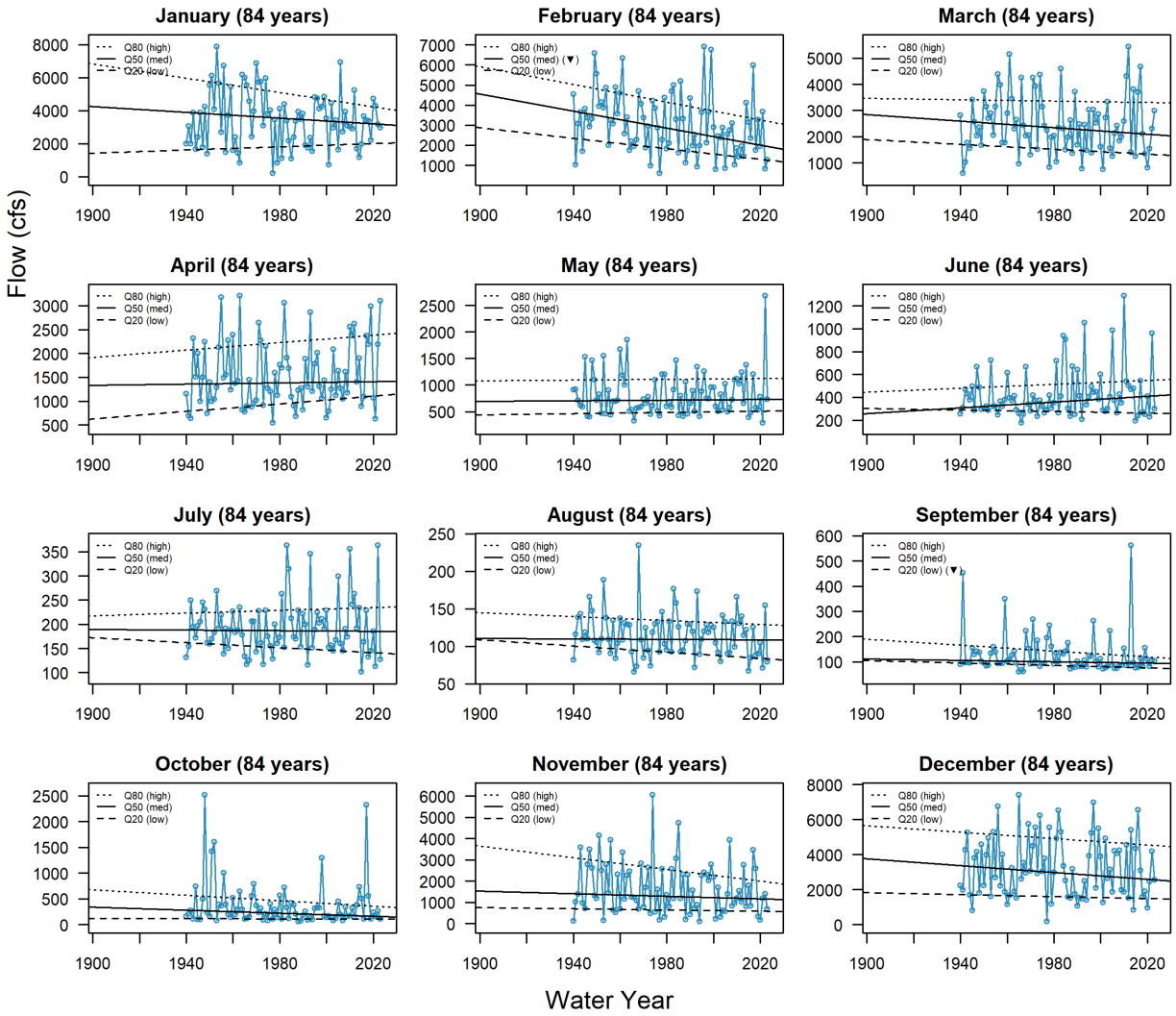
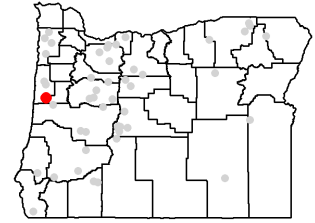


# Long-term Flow Trends for Station #14306500

## Annual Flow at Station #14306500 (84 years, 1940-2023)

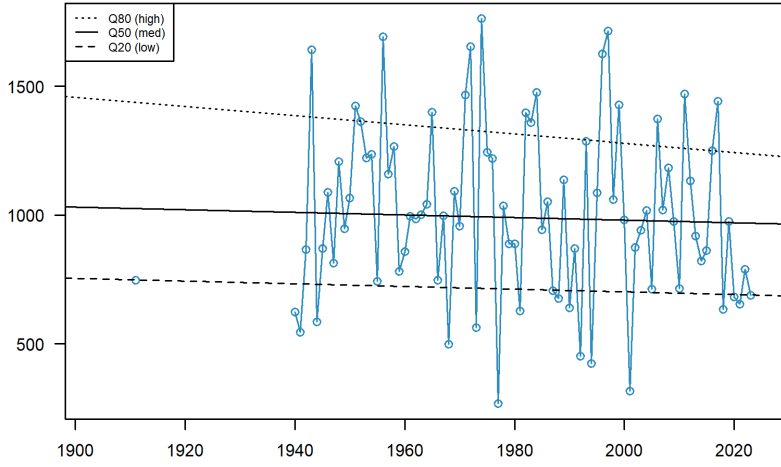


## Station #14306500

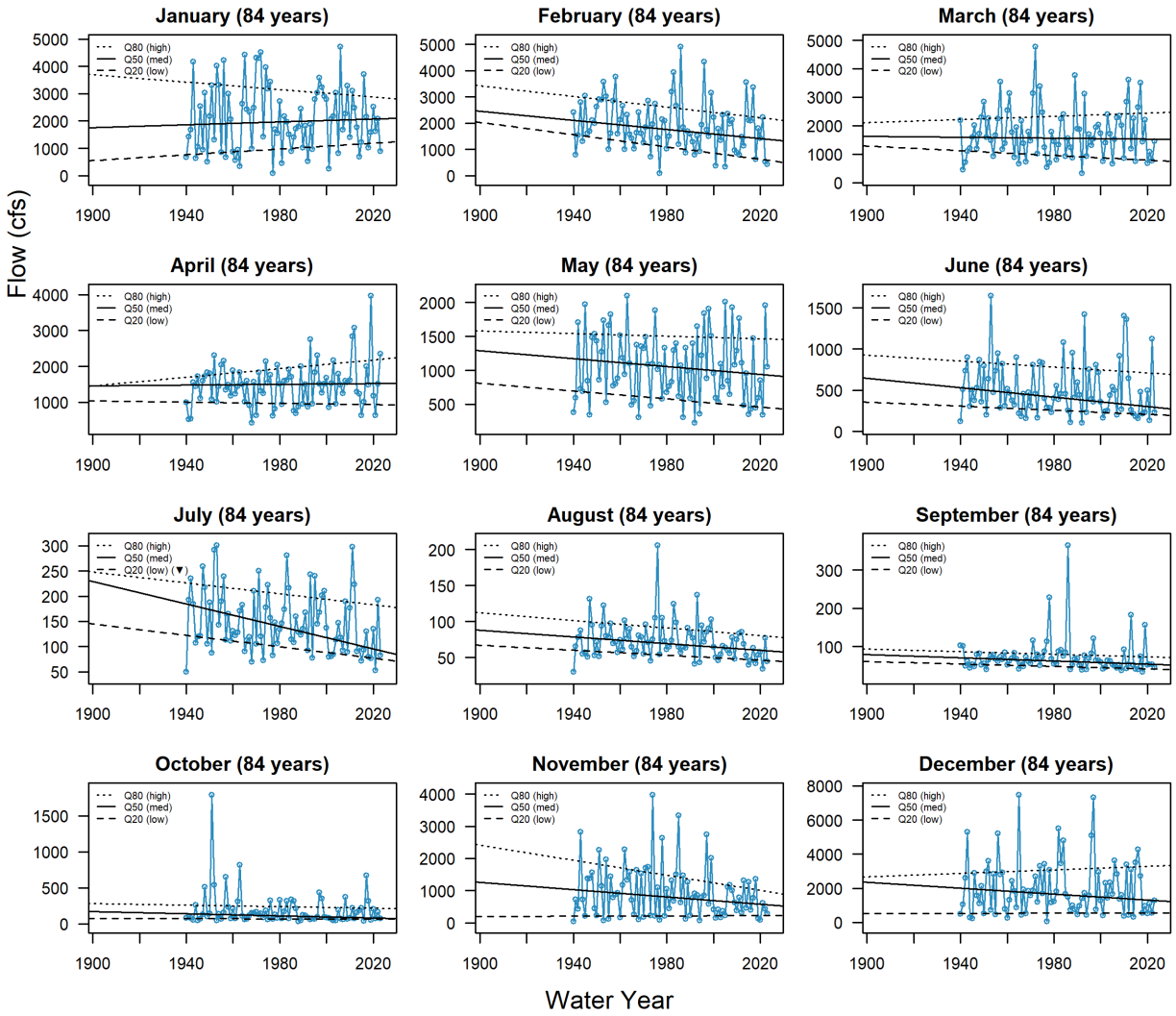
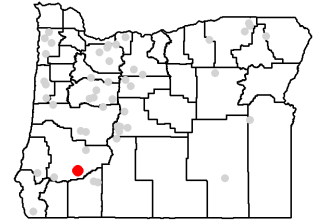


# Long-term Flow Trends for Station #14308000

## Annual Flow at Station #14308000 (85 years, 1911-2023)

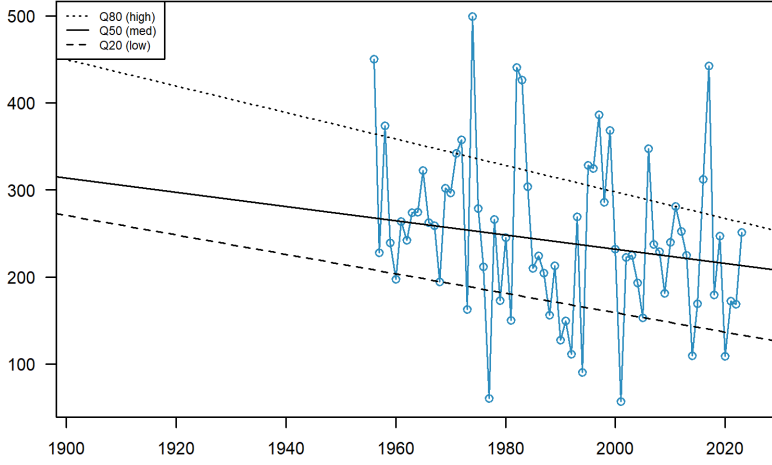


## Station #14308000

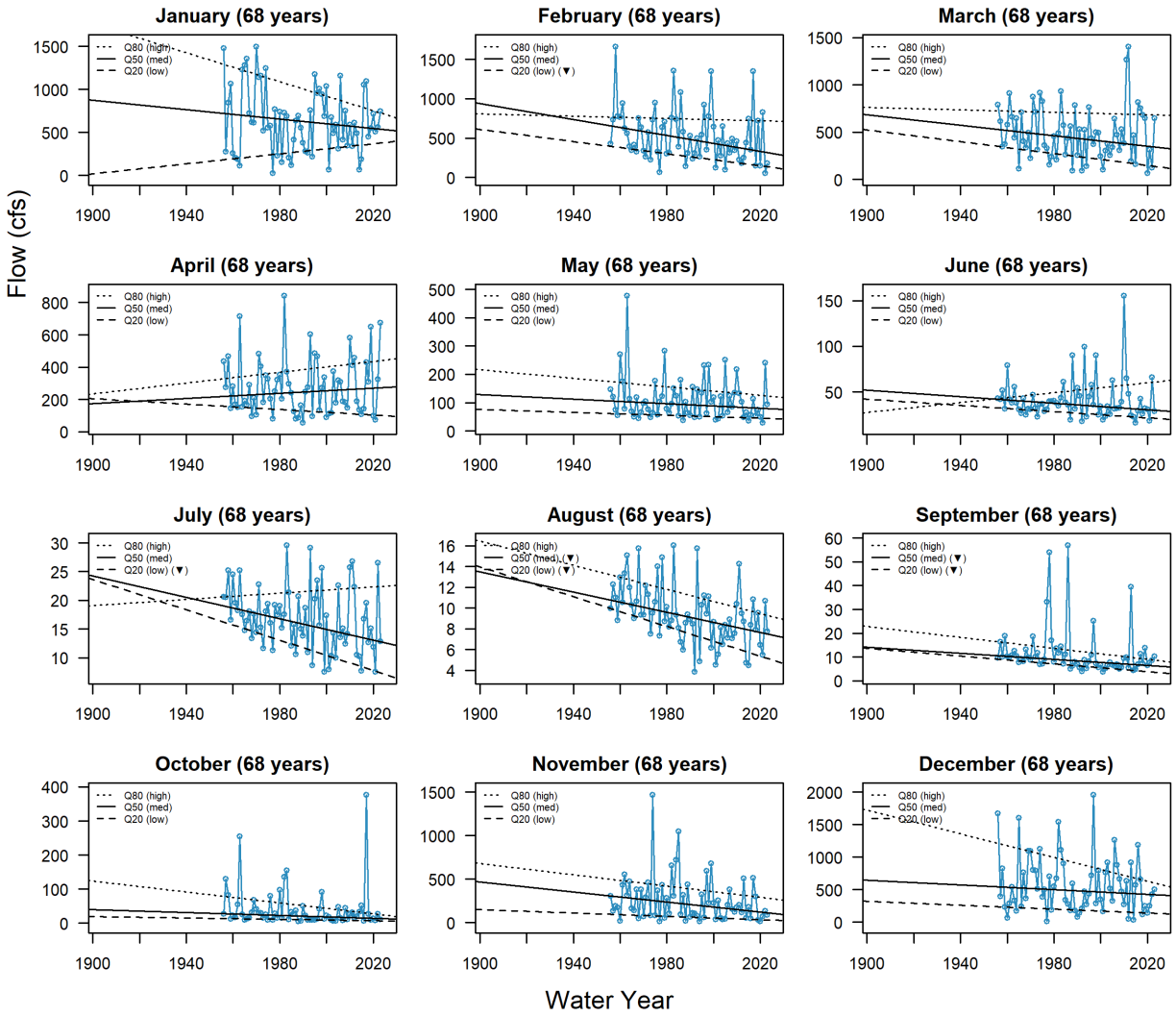
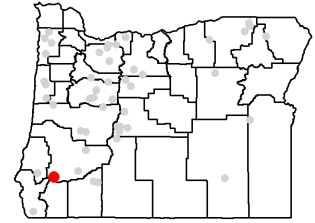


# Long-term Flow Trends for Station #14309500

Annual Flow at Station #14309500 (68 years, 1956-2023)

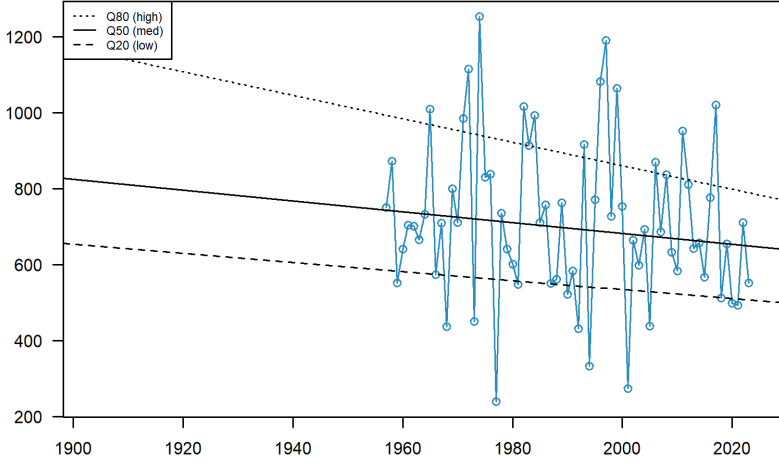


Station #14309500

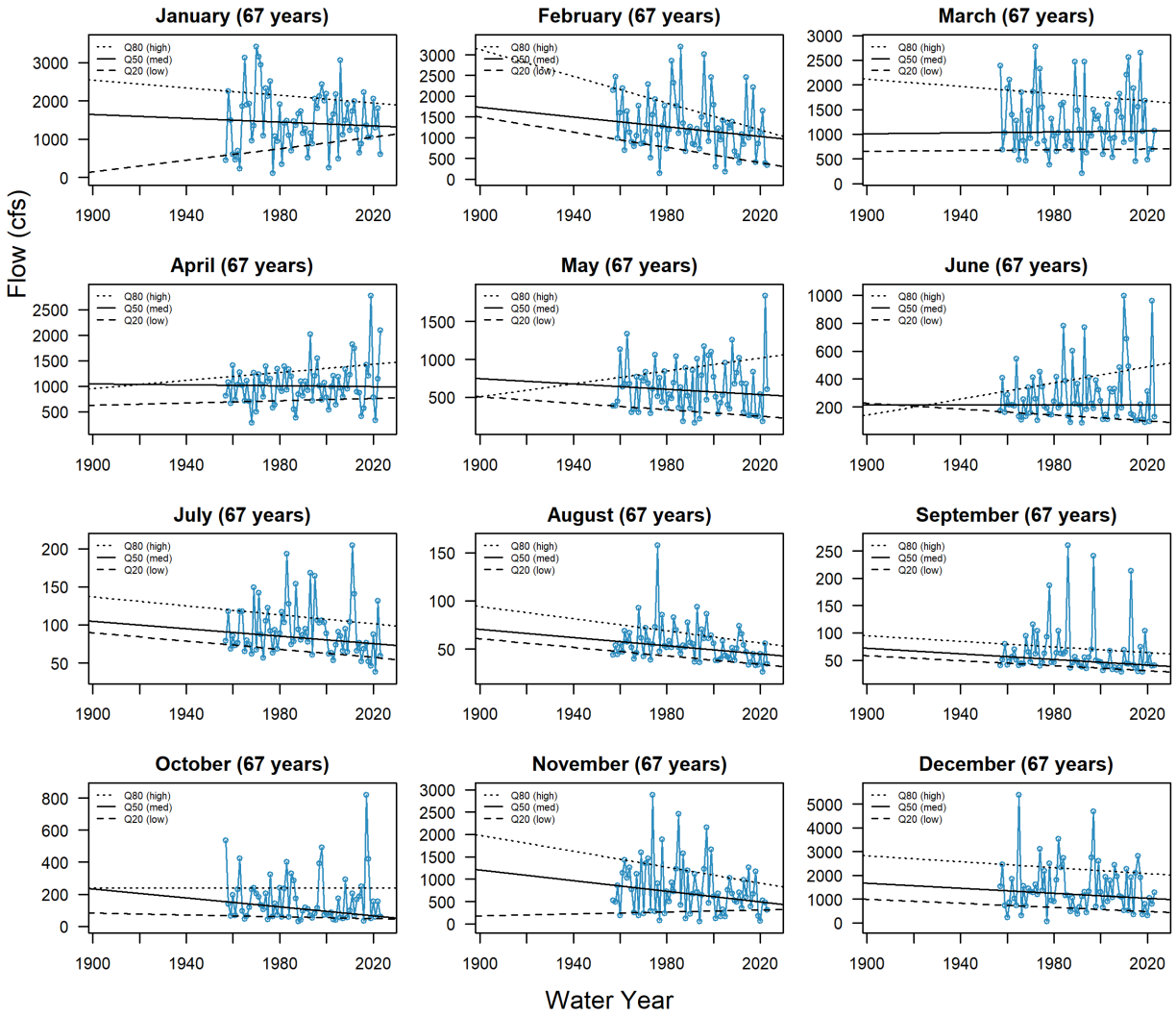
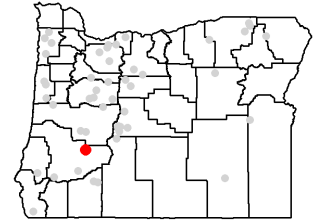


# Long-term Flow Trends for Station #14316700

## Annual Flow at Station #14316700 (67 years, 1957-2023)

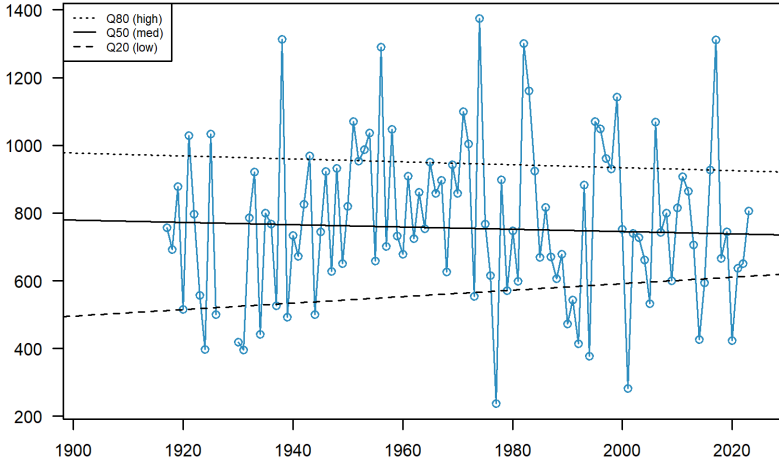


## Station #14316700

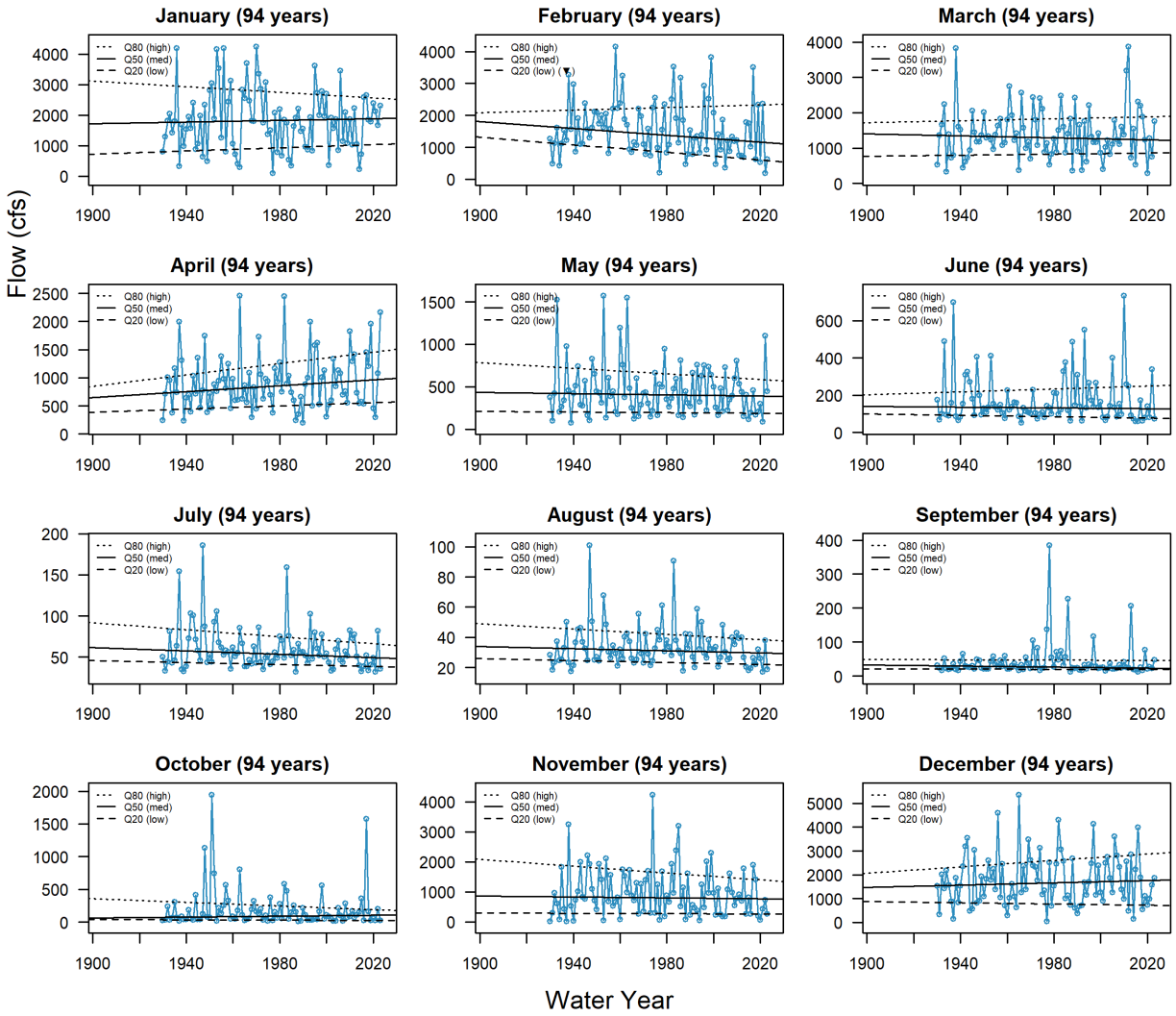
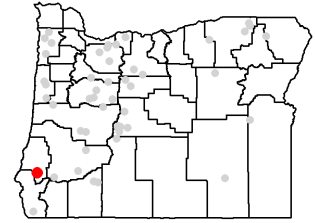


# Long-term Flow Trends for Station #14325000

## Annual Flow at Station #14325000 (104 years, 1917-2023)

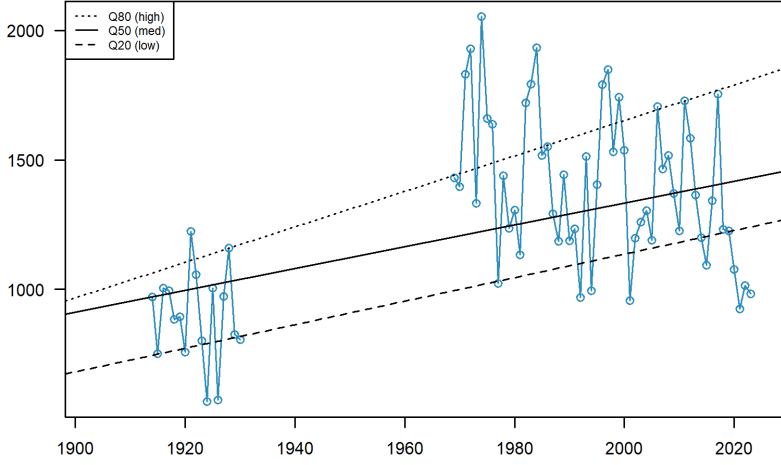


## Station #14325000

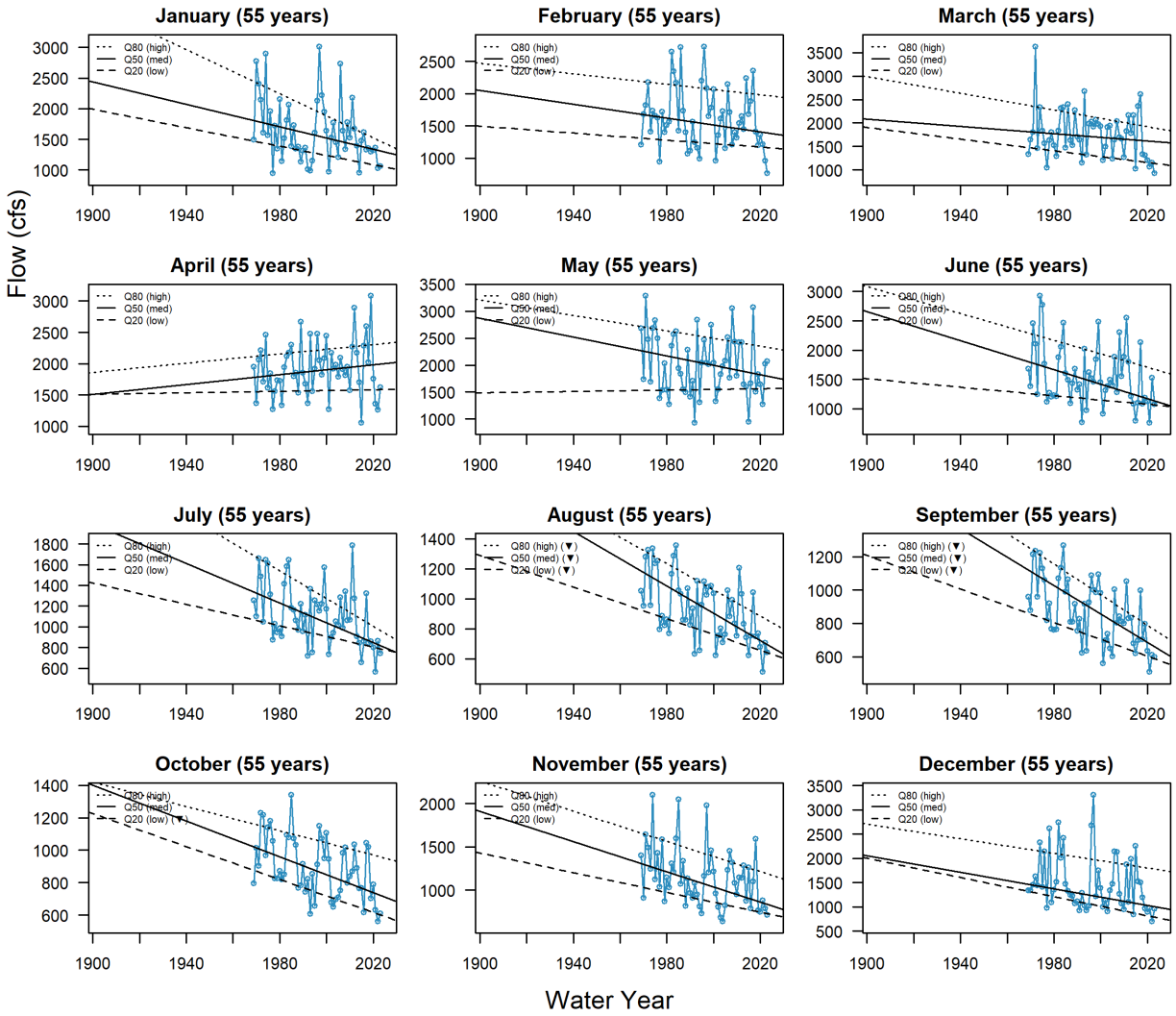
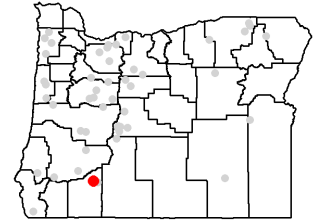


# Long-term Flow Trends for Station #14330000

Annual Flow at Station #14330000 (72 years, 1914-2023)

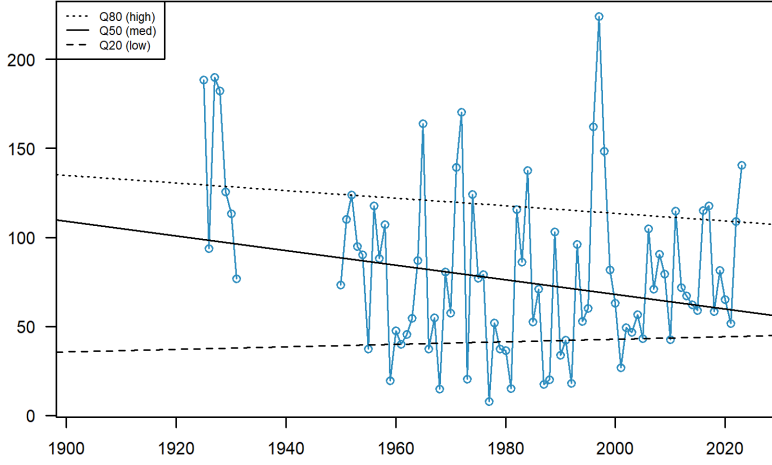


Station #14330000

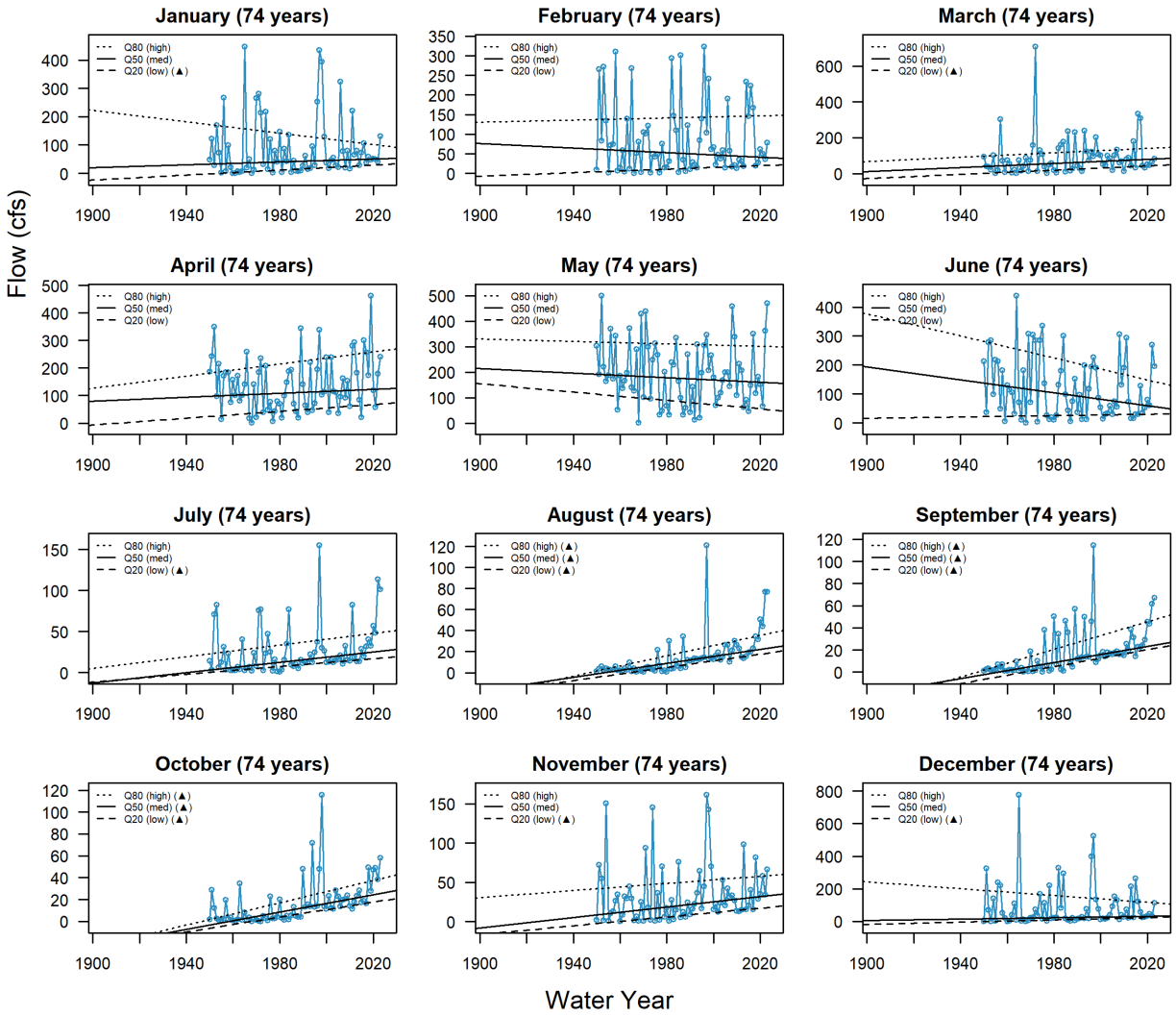
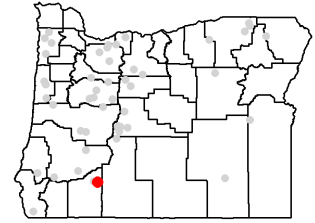


# Long-term Flow Trends for Station #14332000

## Annual Flow at Station #14332000 (81 years, 1925-2023)

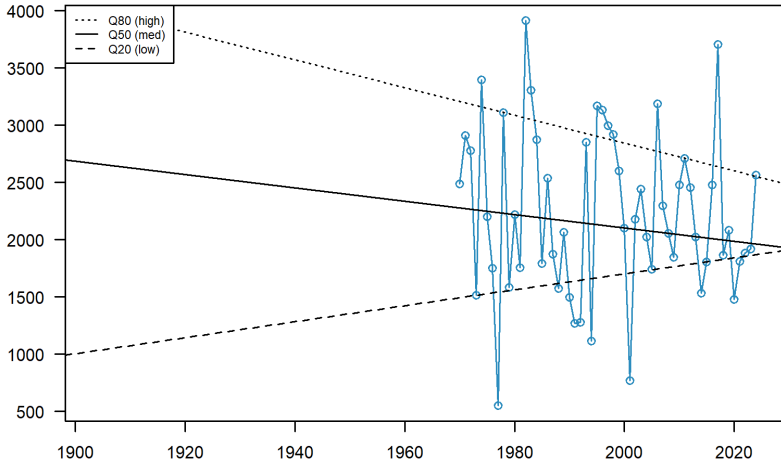


## Station #14332000

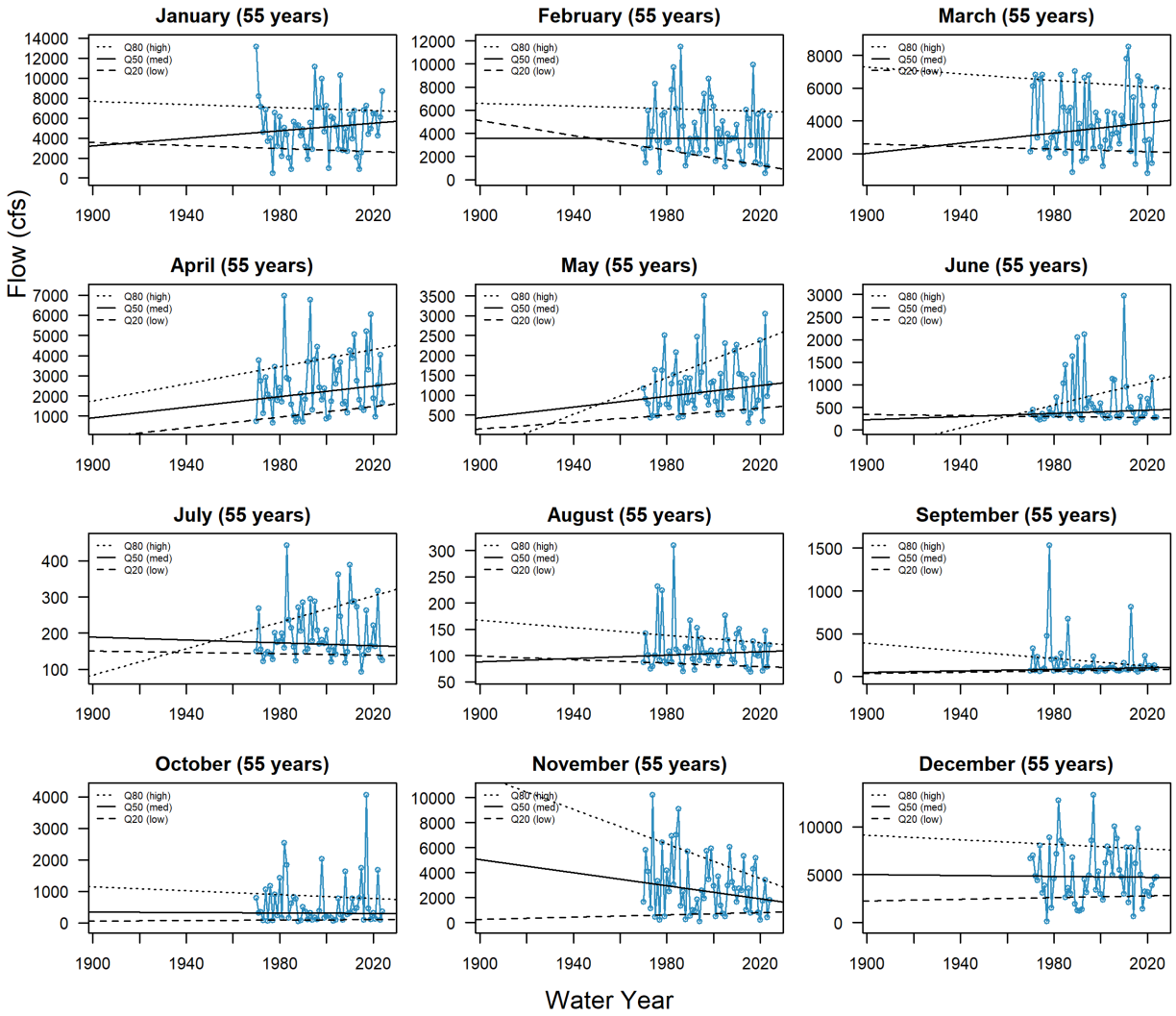
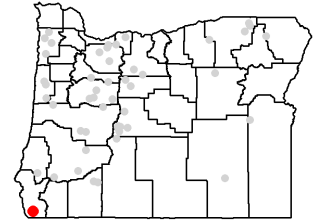


# Long-term Flow Trends for Station #14400000

## Annual Flow at Station #14400000 (55 years, 1970-2024)



## Station #14400000

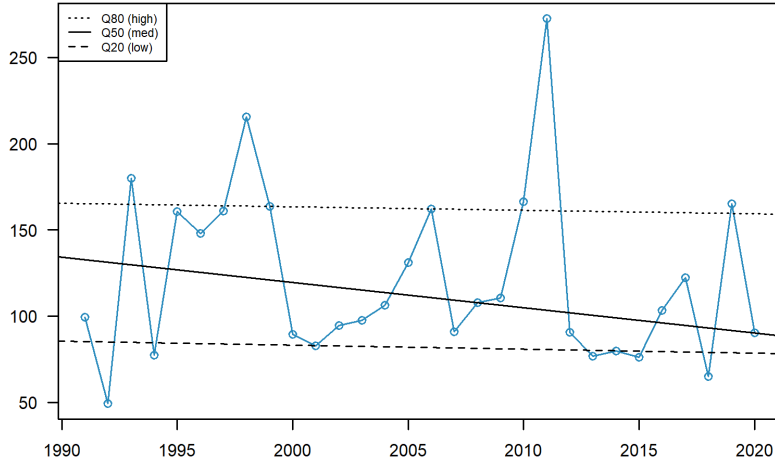


## Appendix E: Individual Station Results – Quantile Regression – Base Period

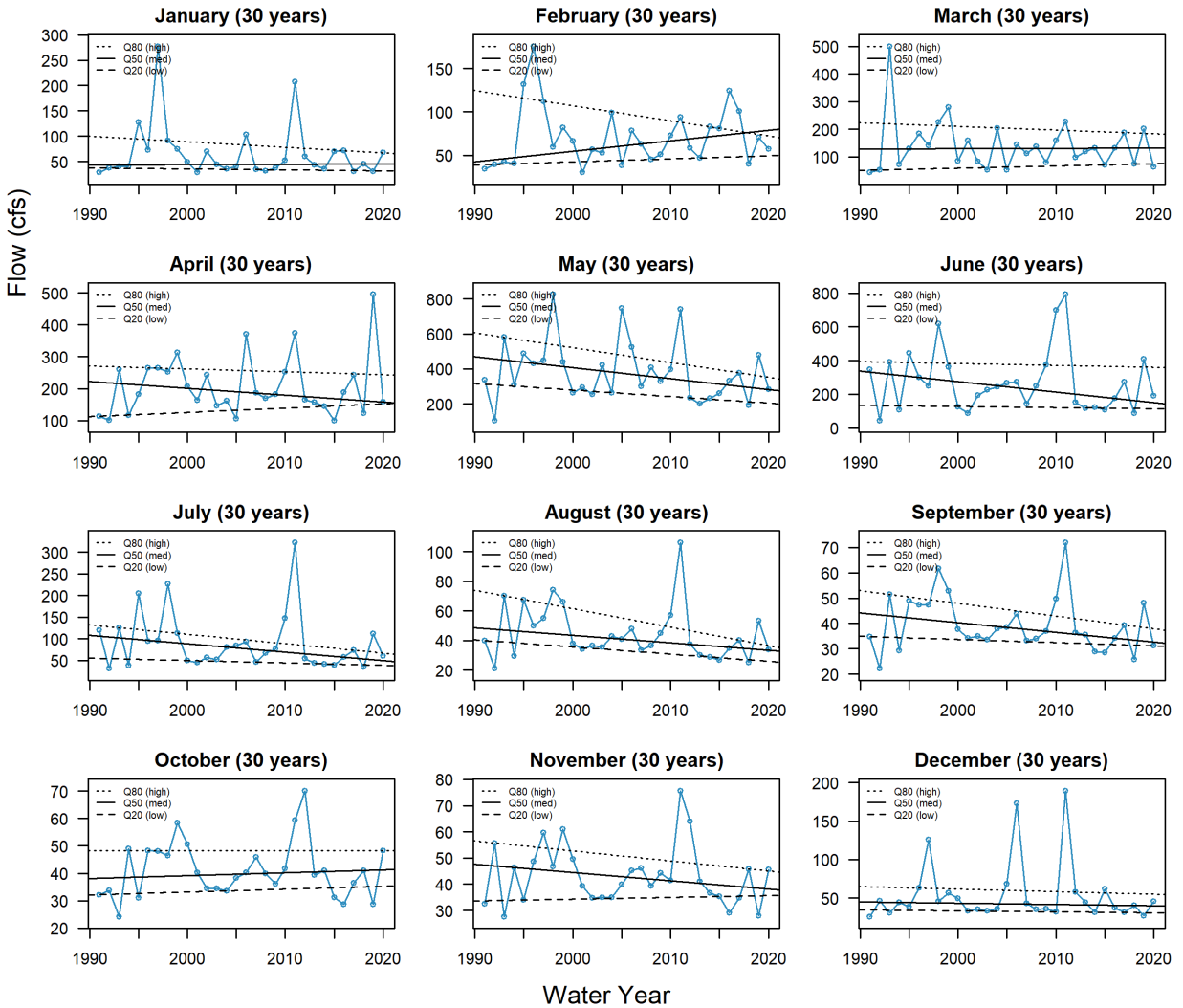
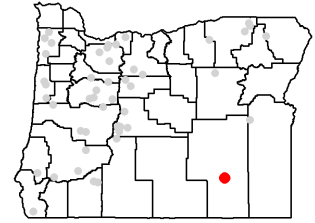
Quantile regression of streamflow stations for the base period (water years 1991-2020). Each figure shows the 10-year moving average annual flow (top panel) and monthly flows (12 smaller panels) for 20th, 50th, and 80th non-exceedance percentile (Q) flows. Upward (▲) and downward (▼) triangles in legends indicate significant trends ( $p < 0.05$ ). Note that y-axis varies among subplots within the same figure.

Base-period Flow Trends for Station #10396000

Annual Flow at Station #10396000 (30 years, 1991-2020)

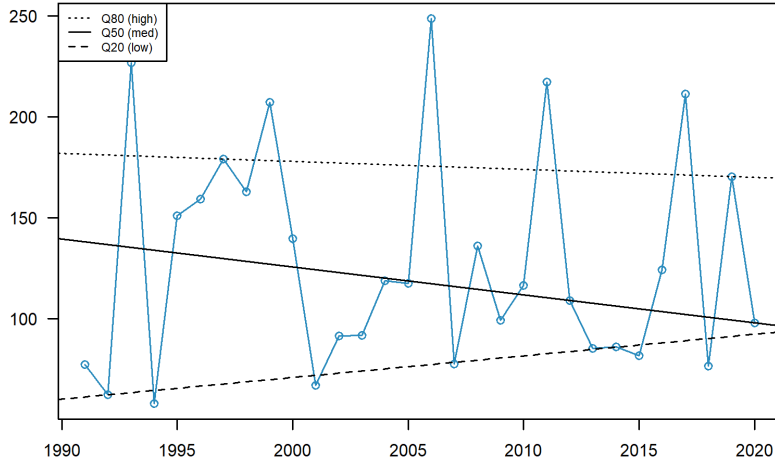


Station #10396000

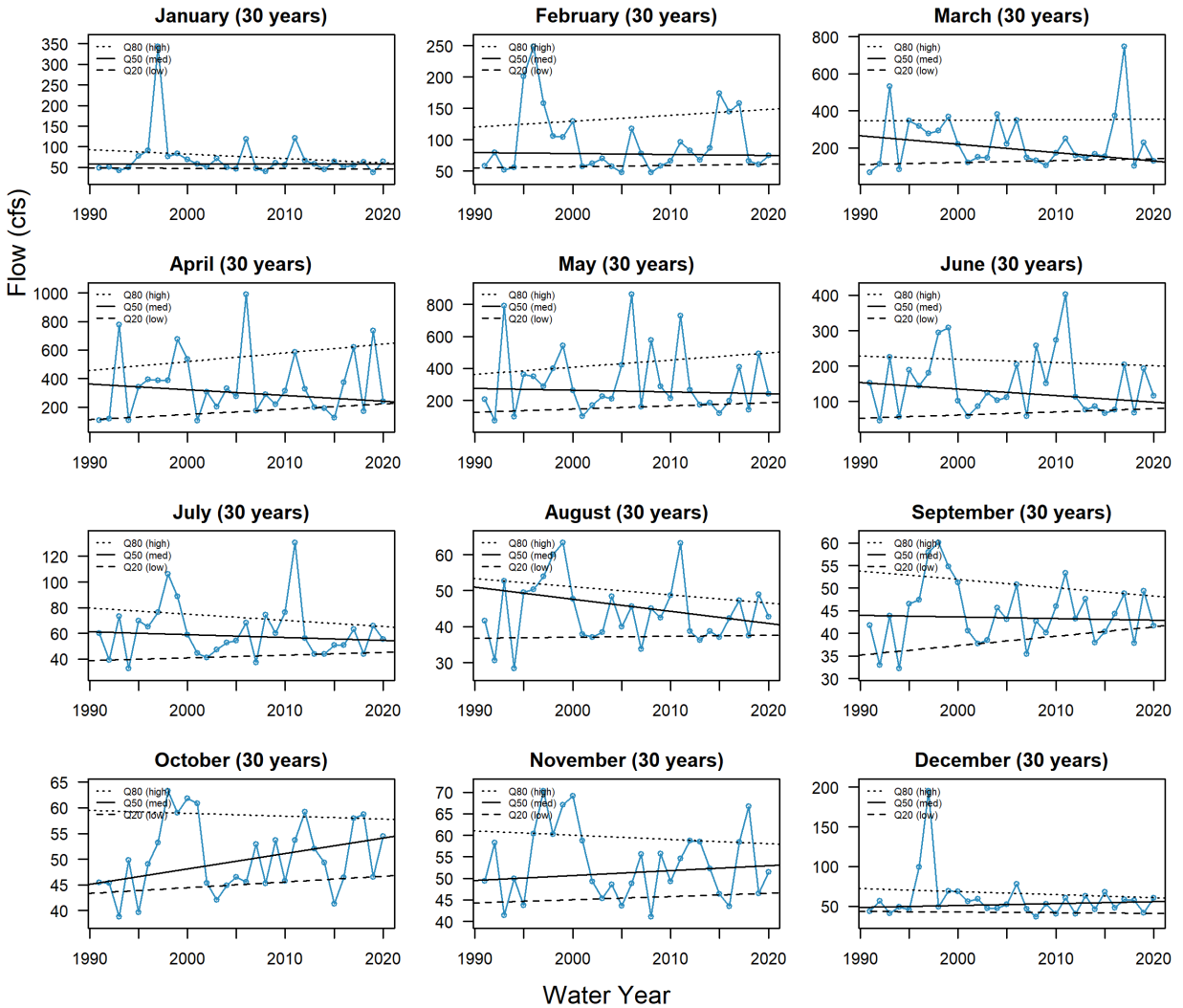
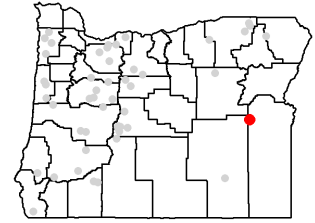


Base-period Flow Trends for Station #13216500

Annual Flow at Station #13216500 (30 years, 1991-2020)

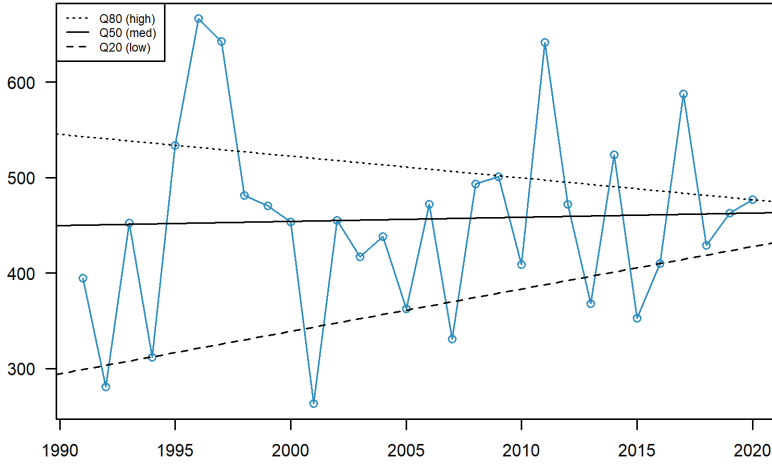


Station #13216500

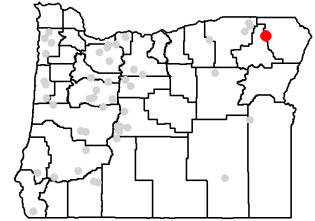


Base-period Flow Trends for Station #13331500

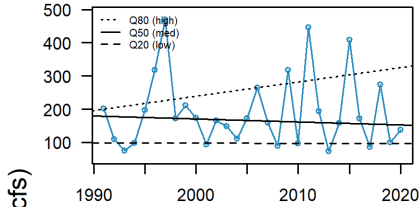
Annual Flow at Station #13331500 (30 years, 1991-2020)



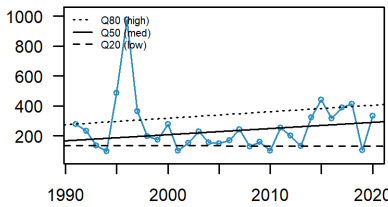
Station #13331500



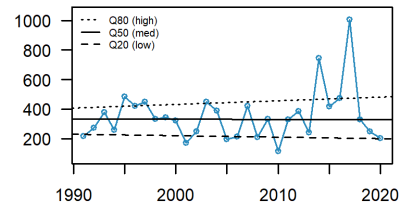
January (30 years)



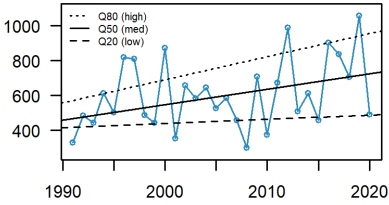
February (30 years)



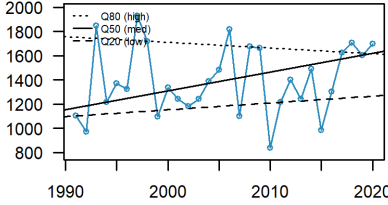
March (30 years)



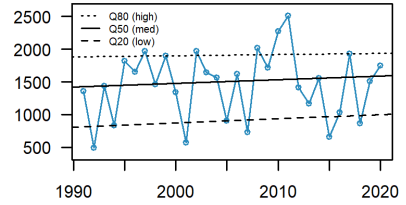
April (30 years)



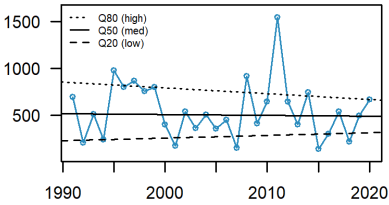
May (30 years)



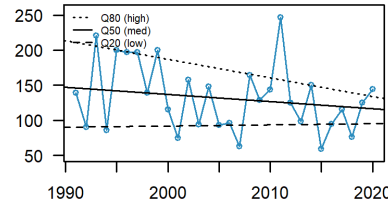
June (30 years)



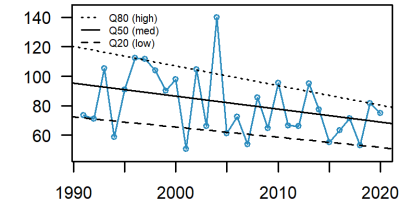
July (30 years)



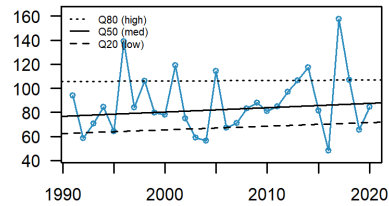
August (30 years)



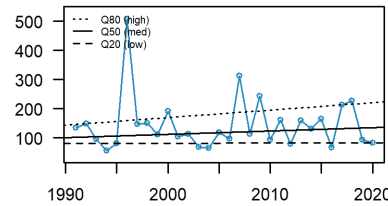
September (30 years)



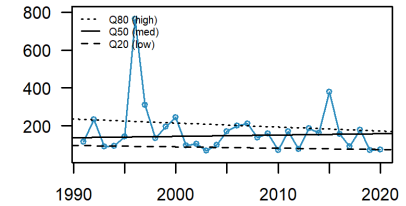
October (30 years)



November (30 years)



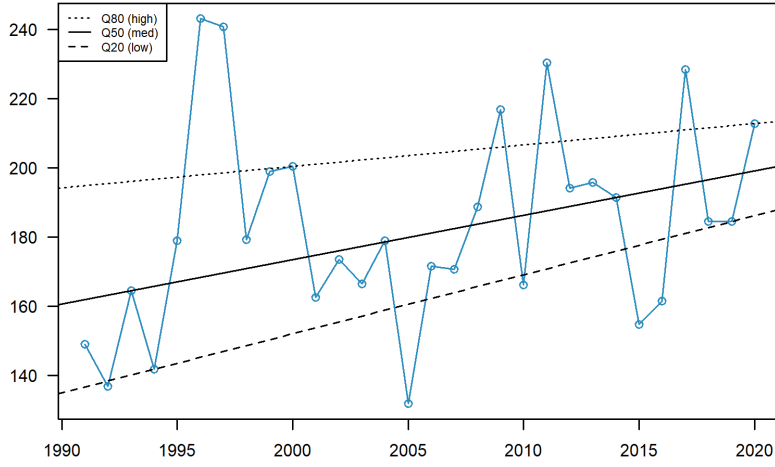
December (30 years)



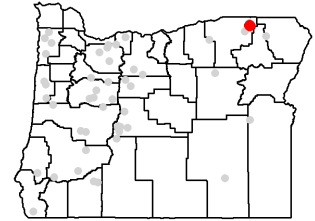
Water Year

Base-period Flow Trends for Station #14010000

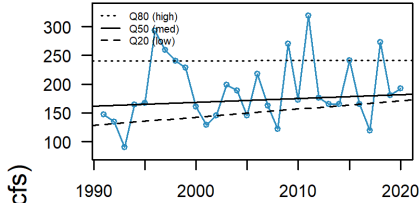
Annual Flow at Station #14010000 (30 years, 1991-2020)



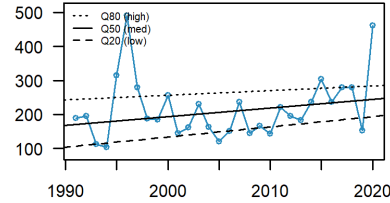
Station #14010000



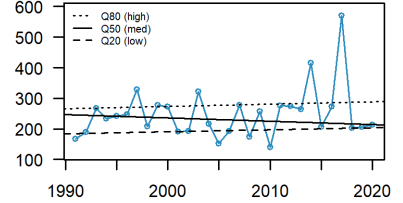
January (30 years)



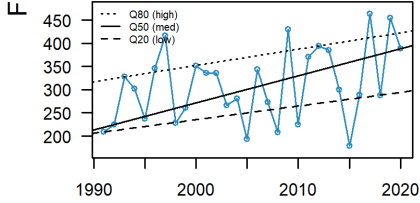
February (30 years)



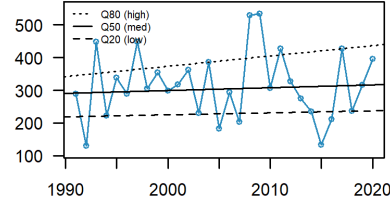
March (30 years)



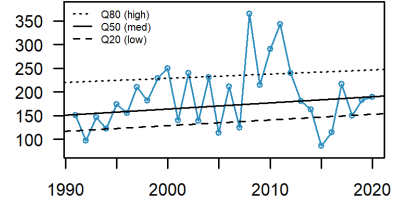
April (30 years)



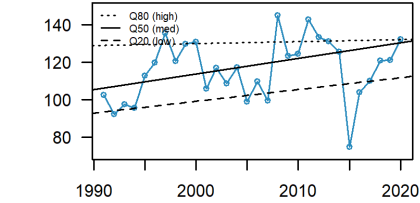
May (30 years)



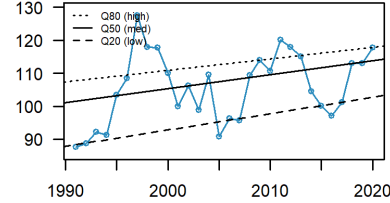
June (30 years)



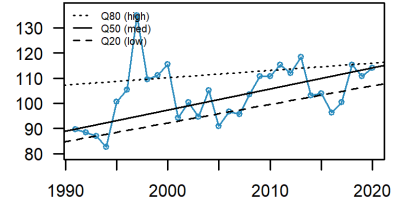
July (30 years)



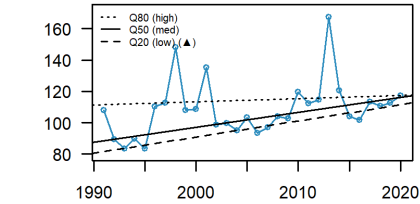
August (30 years)



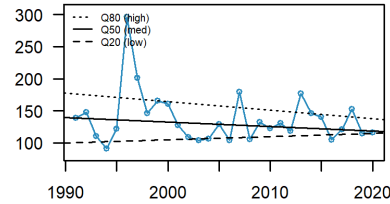
September (30 years)



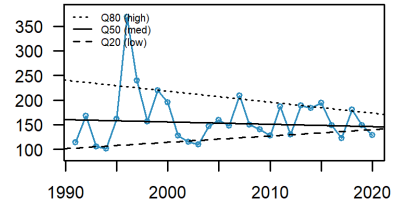
October (30 years)



November (30 years)



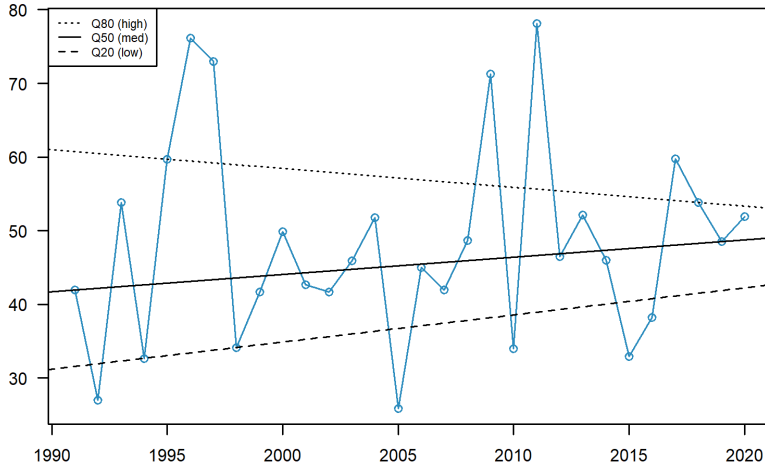
December (30 years)



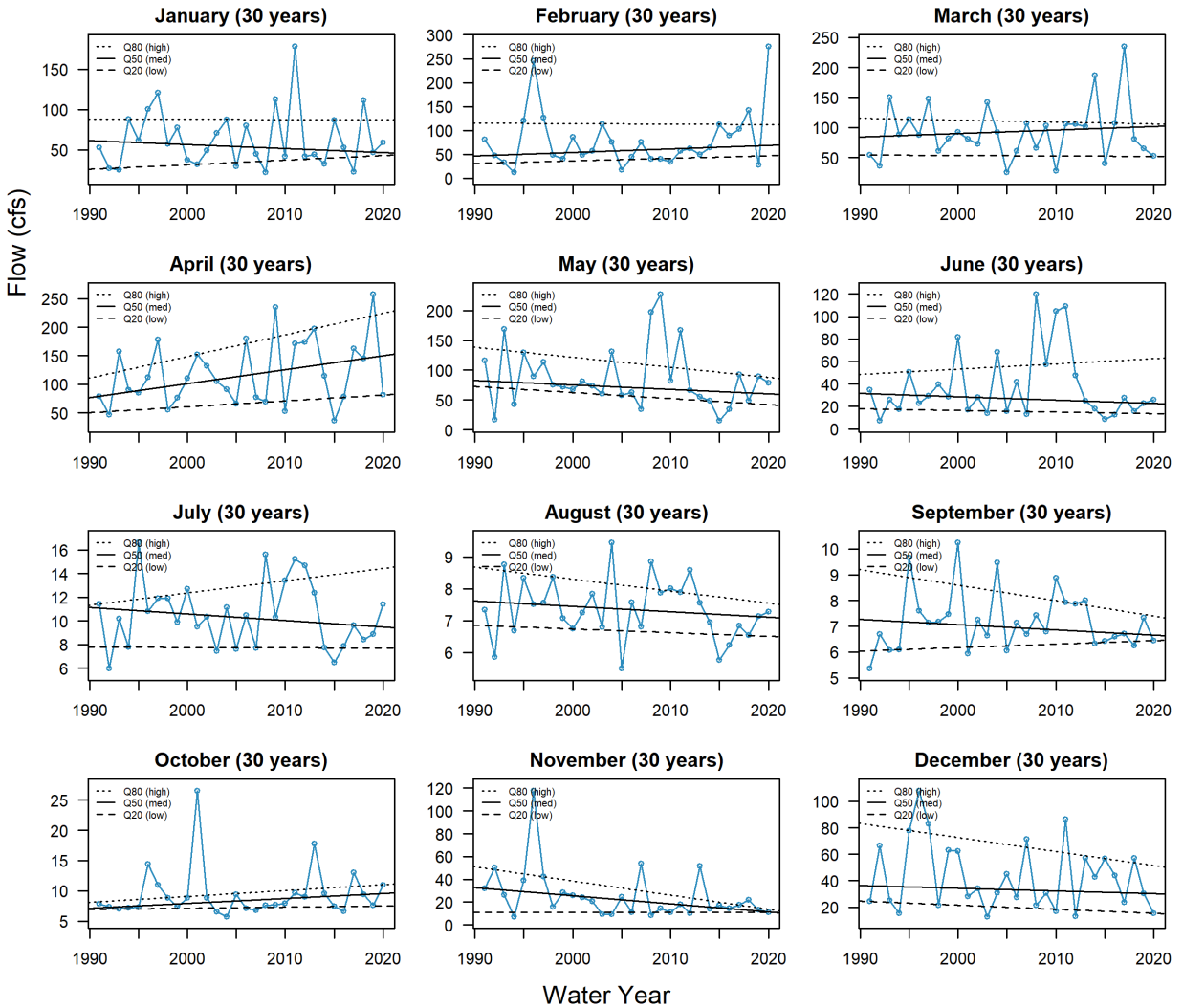
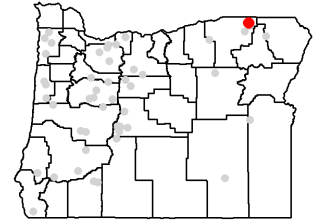
Water Year

Base-period Flow Trends for Station #14010800

Annual Flow at Station #14010800 (30 years, 1991-2020)

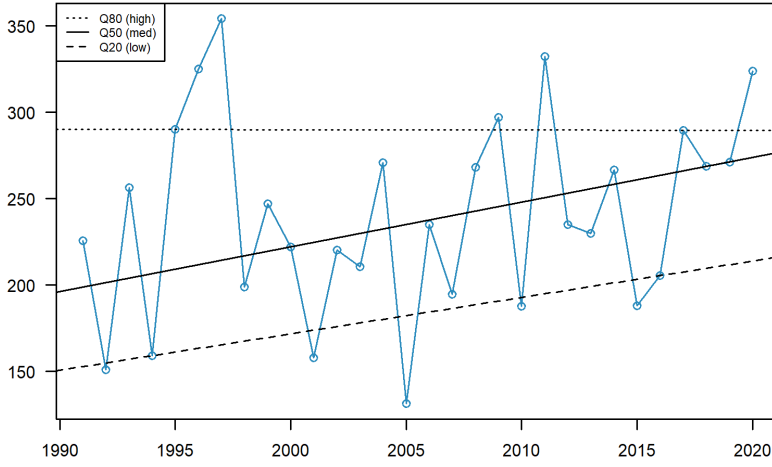


Station #14010800

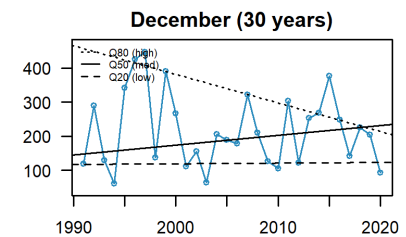
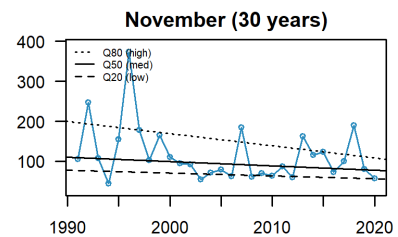
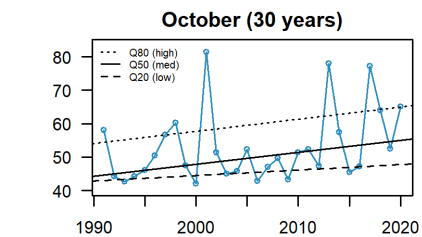
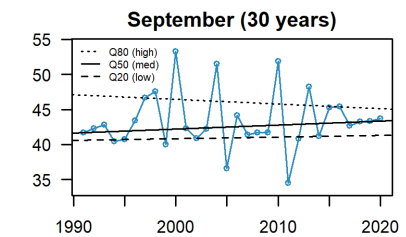
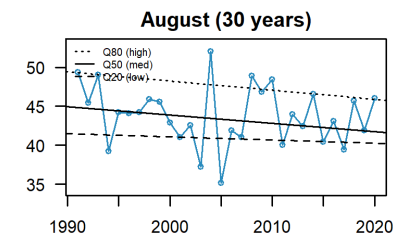
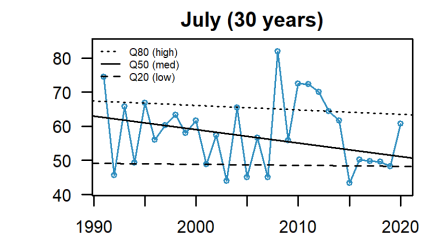
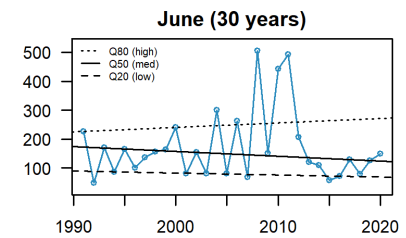
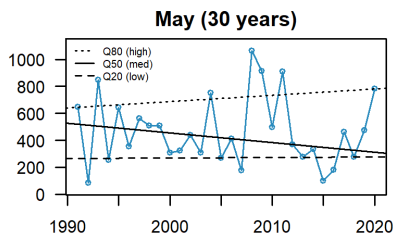
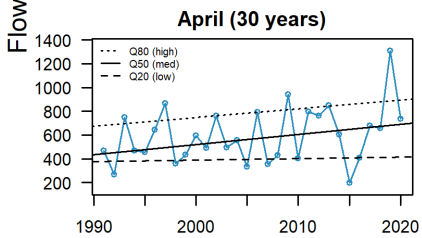
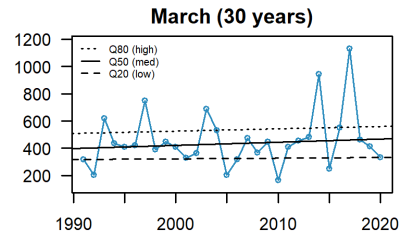
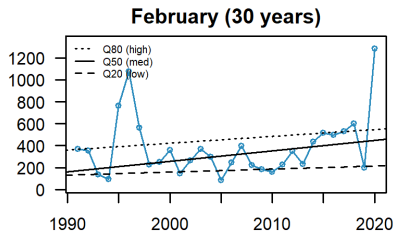
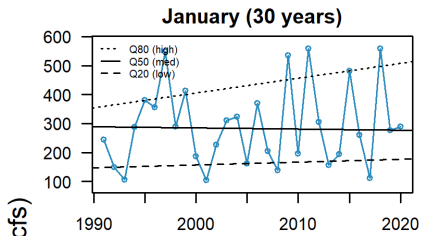
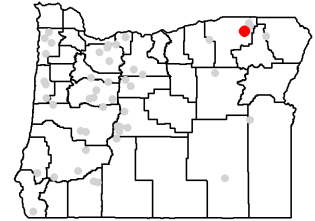


Base-period Flow Trends for Station #14020000

Annual Flow at Station #14020000 (30 years, 1991-2020)



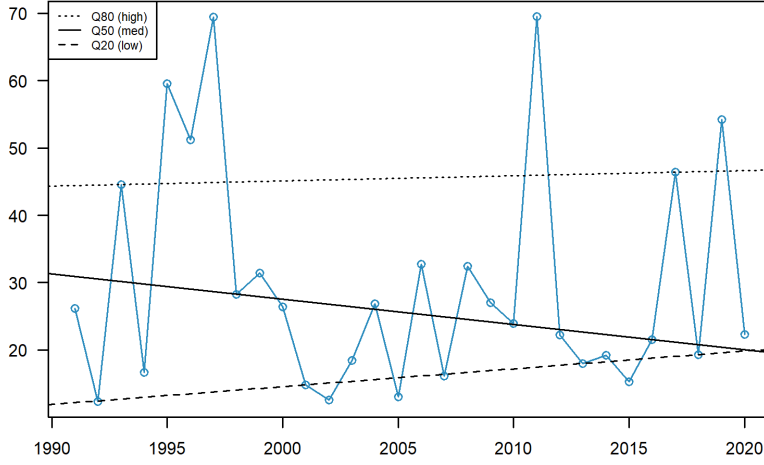
Station #14020000



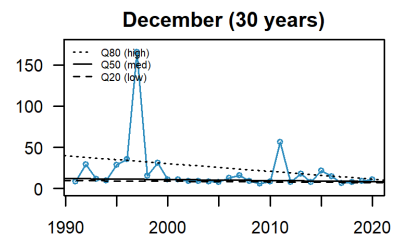
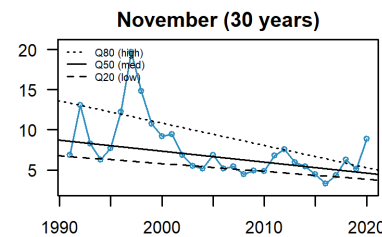
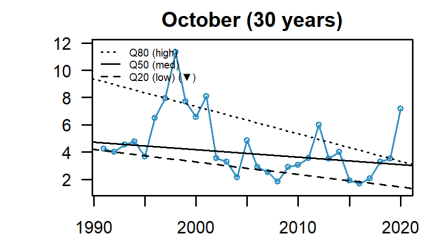
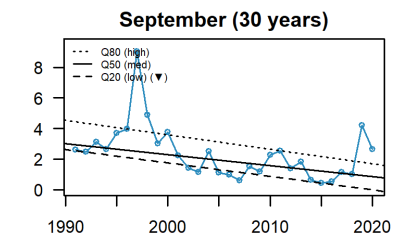
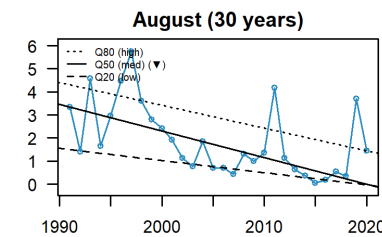
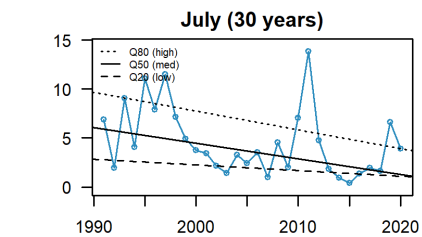
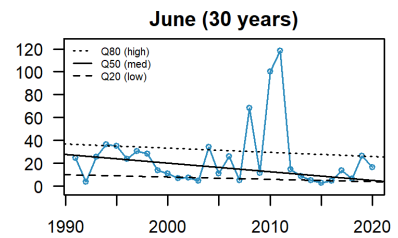
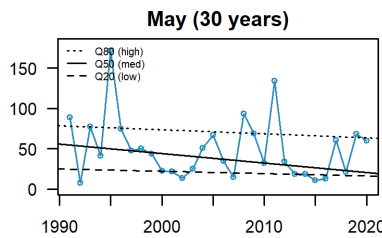
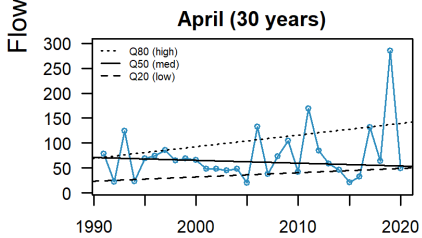
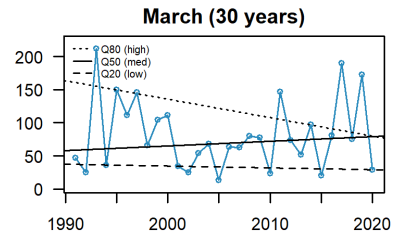
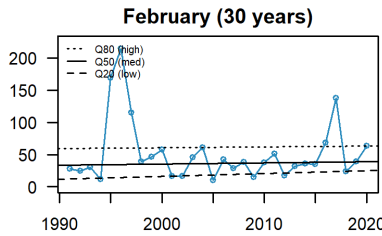
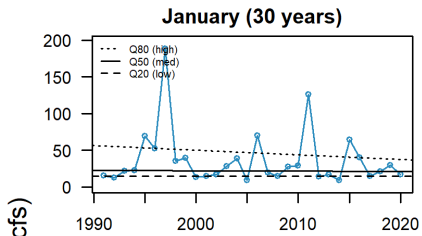
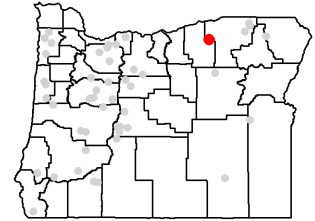
Water Year

Base-period Flow Trends for Station #14032000

Annual Flow at Station #14032000 (30 years, 1991-2020)



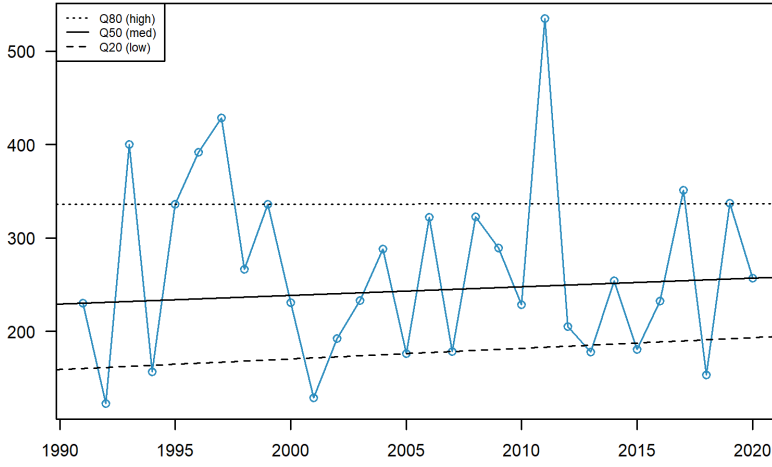
Station #14032000



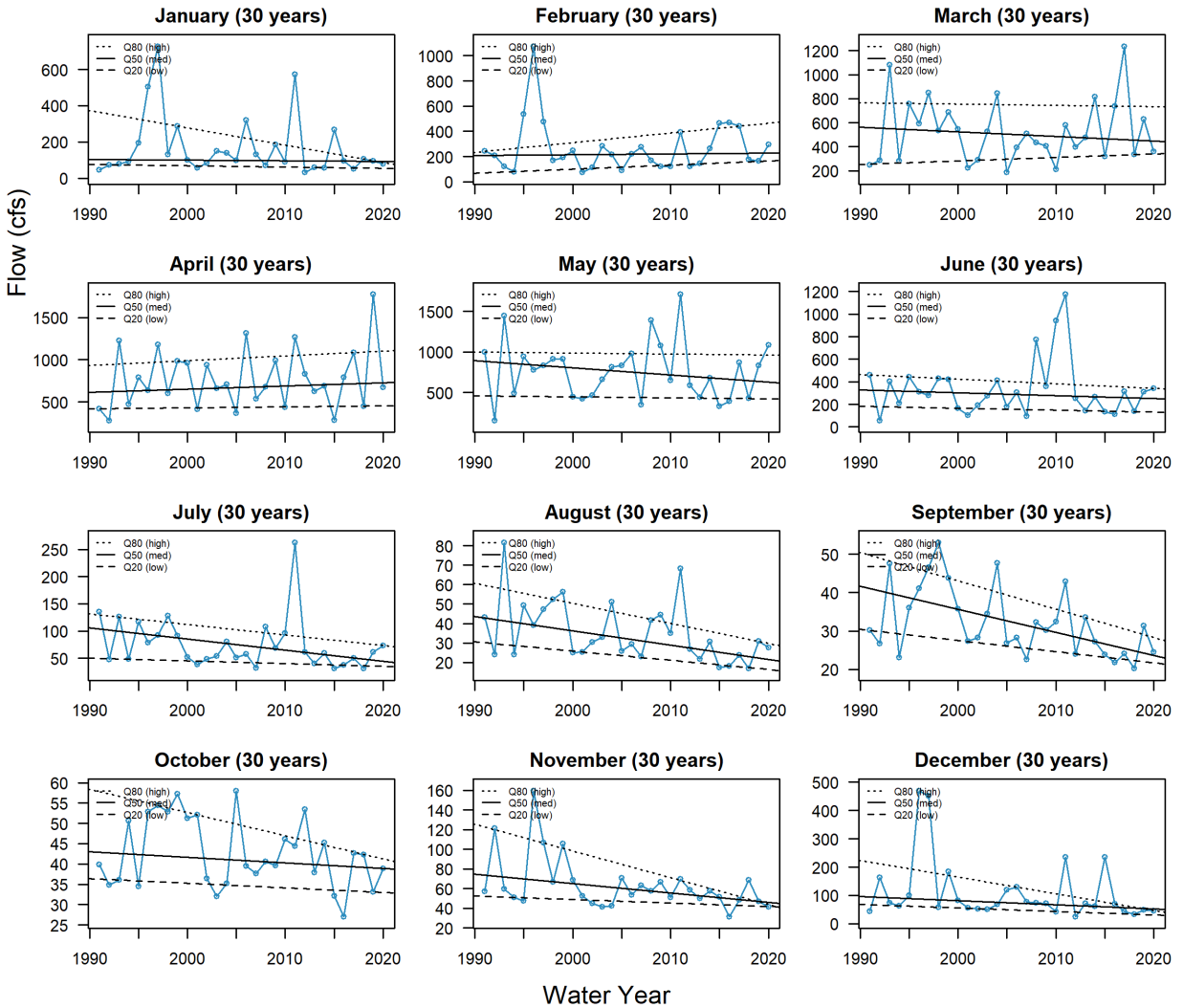
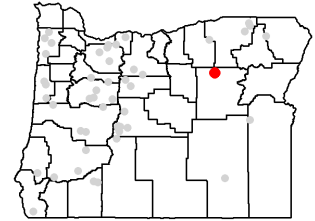
Water Year

Base-period Flow Trends for Station #14044000

Annual Flow at Station #14044000 (30 years, 1991-2020)

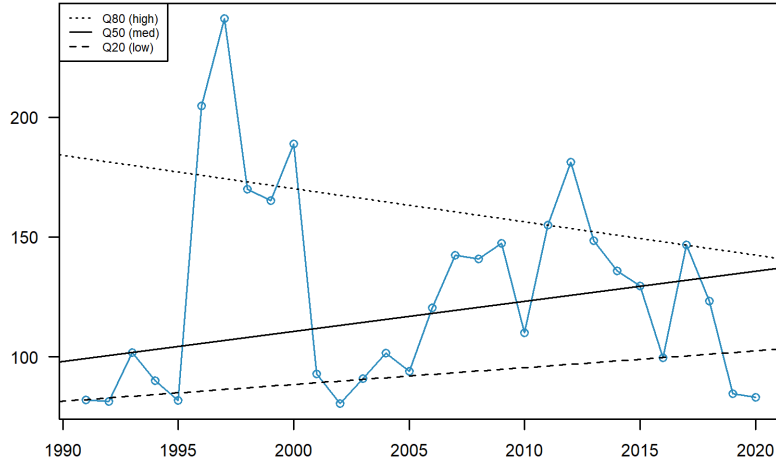


Station #14044000

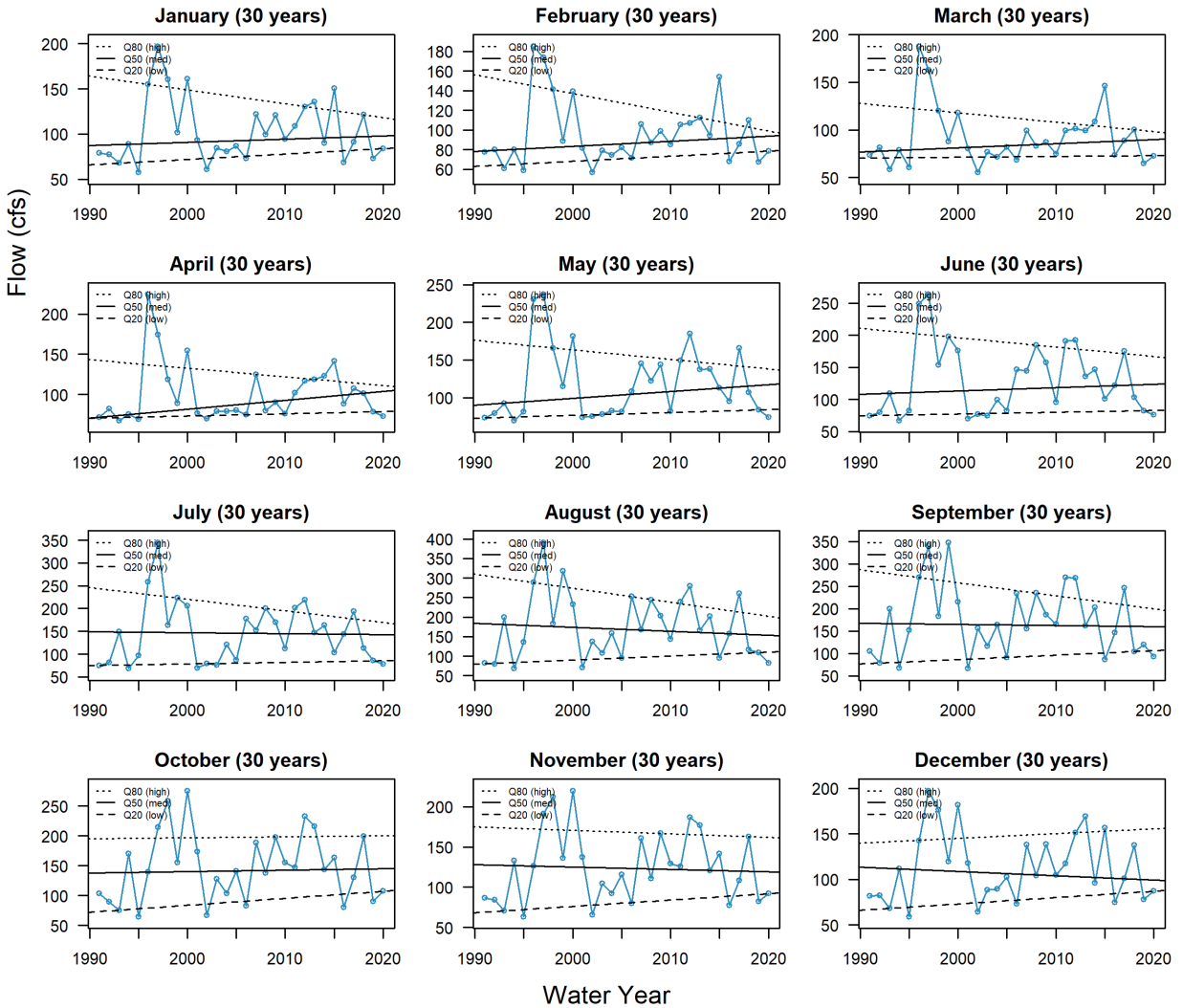
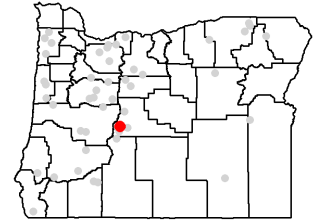


Base-period Flow Trends for Station #14050000

Annual Flow at Station #14050000 (30 years, 1991-2020)

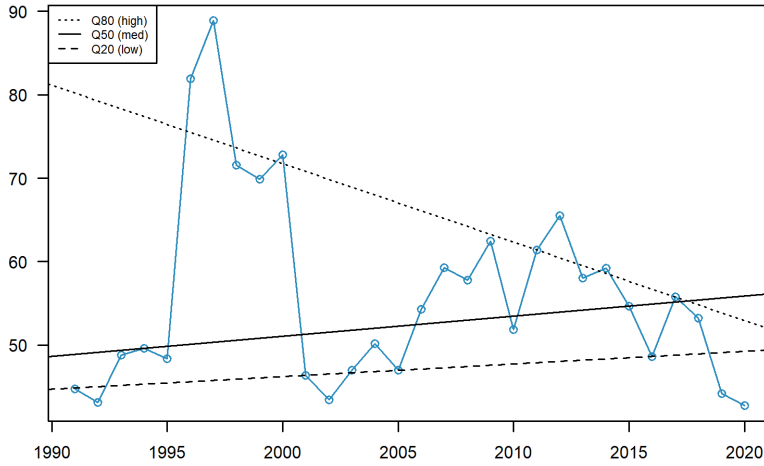


Station #14050000

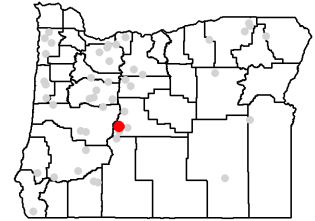


Base-period Flow Trends for Station #14050500

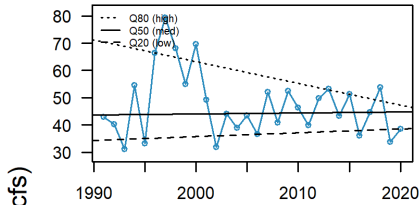
Annual Flow at Station #14050500 (30 years, 1991-2020)



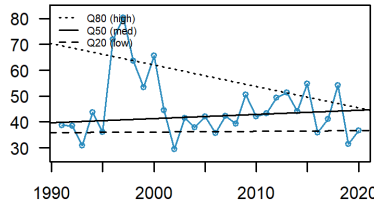
Station #14050500



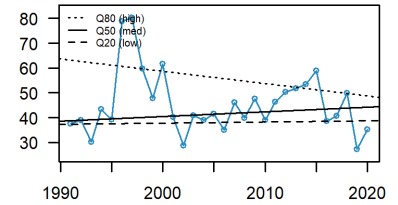
January (30 years)



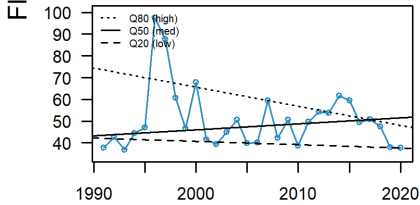
February (30 years)



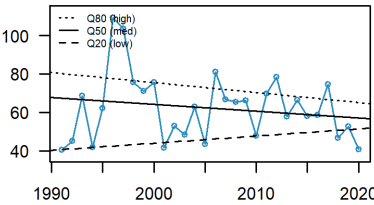
March (30 years)



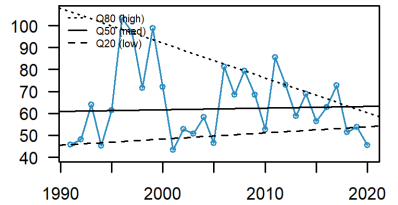
April (30 years)



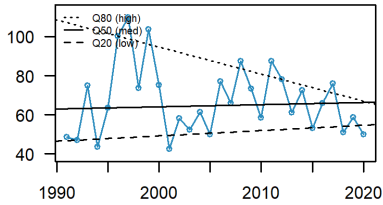
May (30 years)



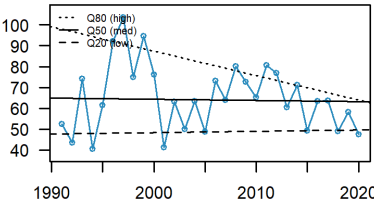
June (30 years)



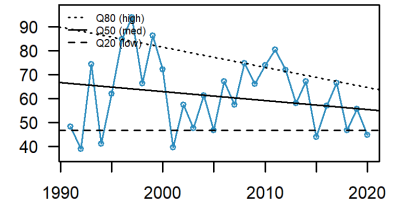
July (30 years)



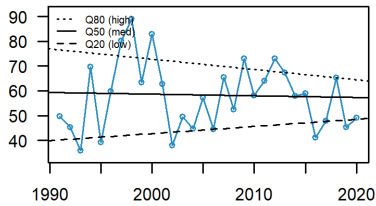
August (30 years)



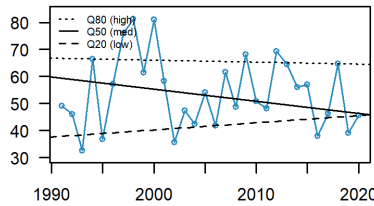
September (30 years)



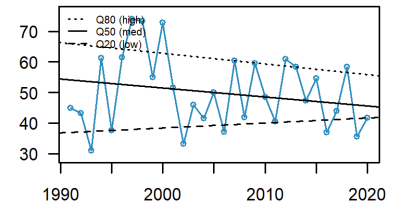
October (30 years)



November (30 years)



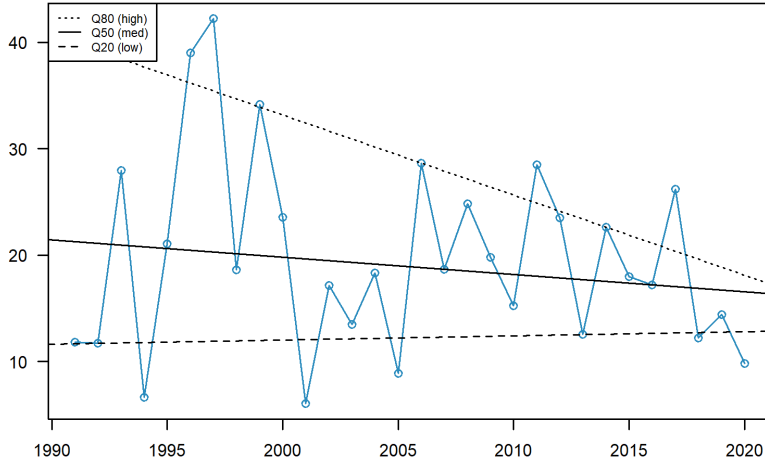
December (30 years)



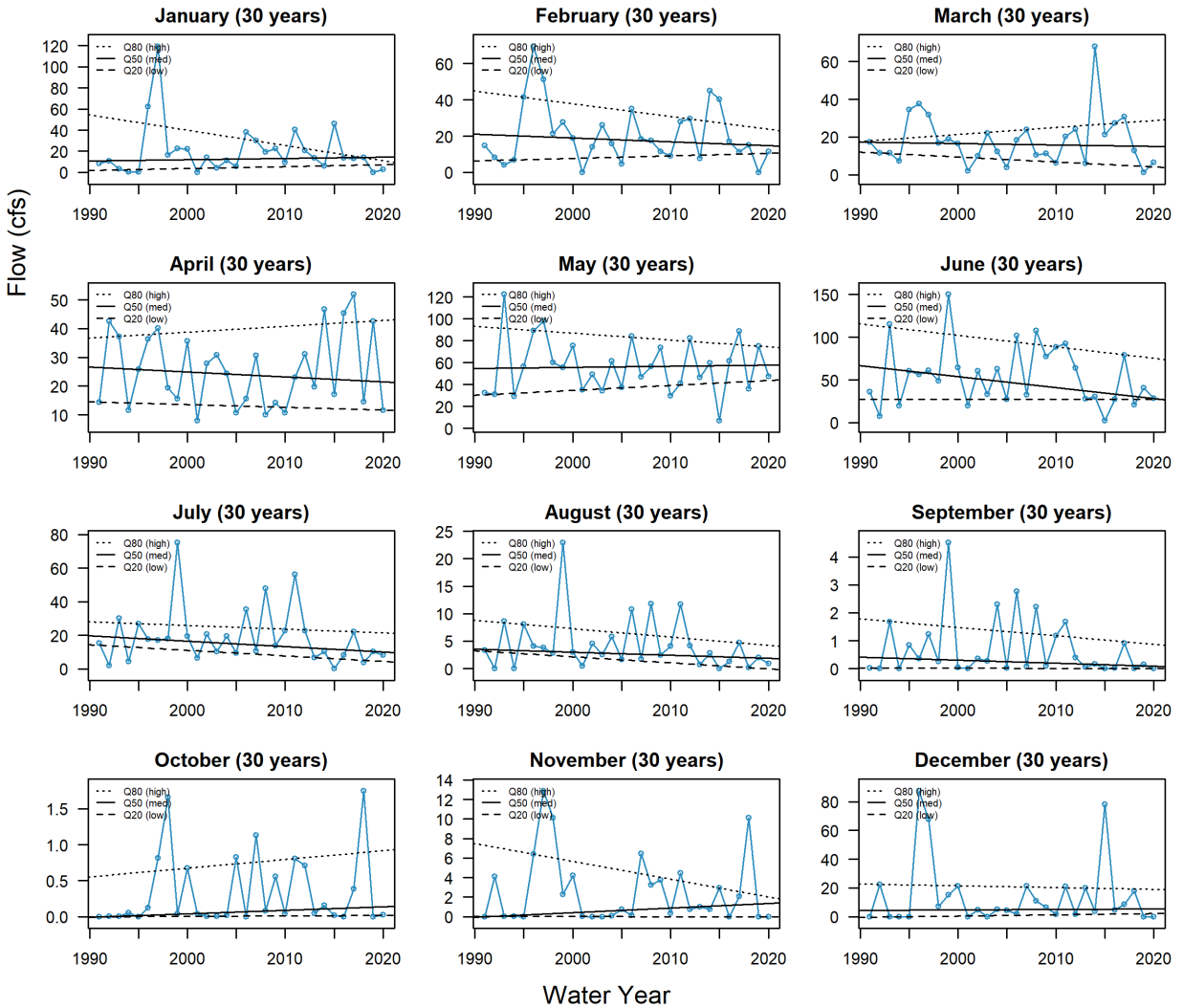
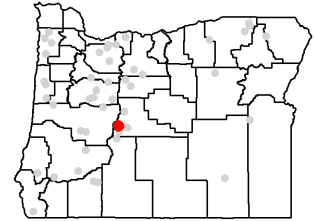
Water Year

Base-period Flow Trends for Station #14051000

Annual Flow at Station #14051000 (30 years, 1991-2020)

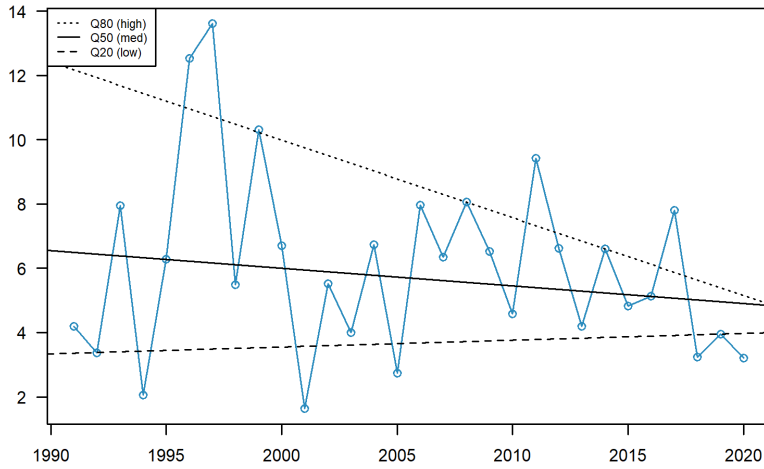


Station #14051000

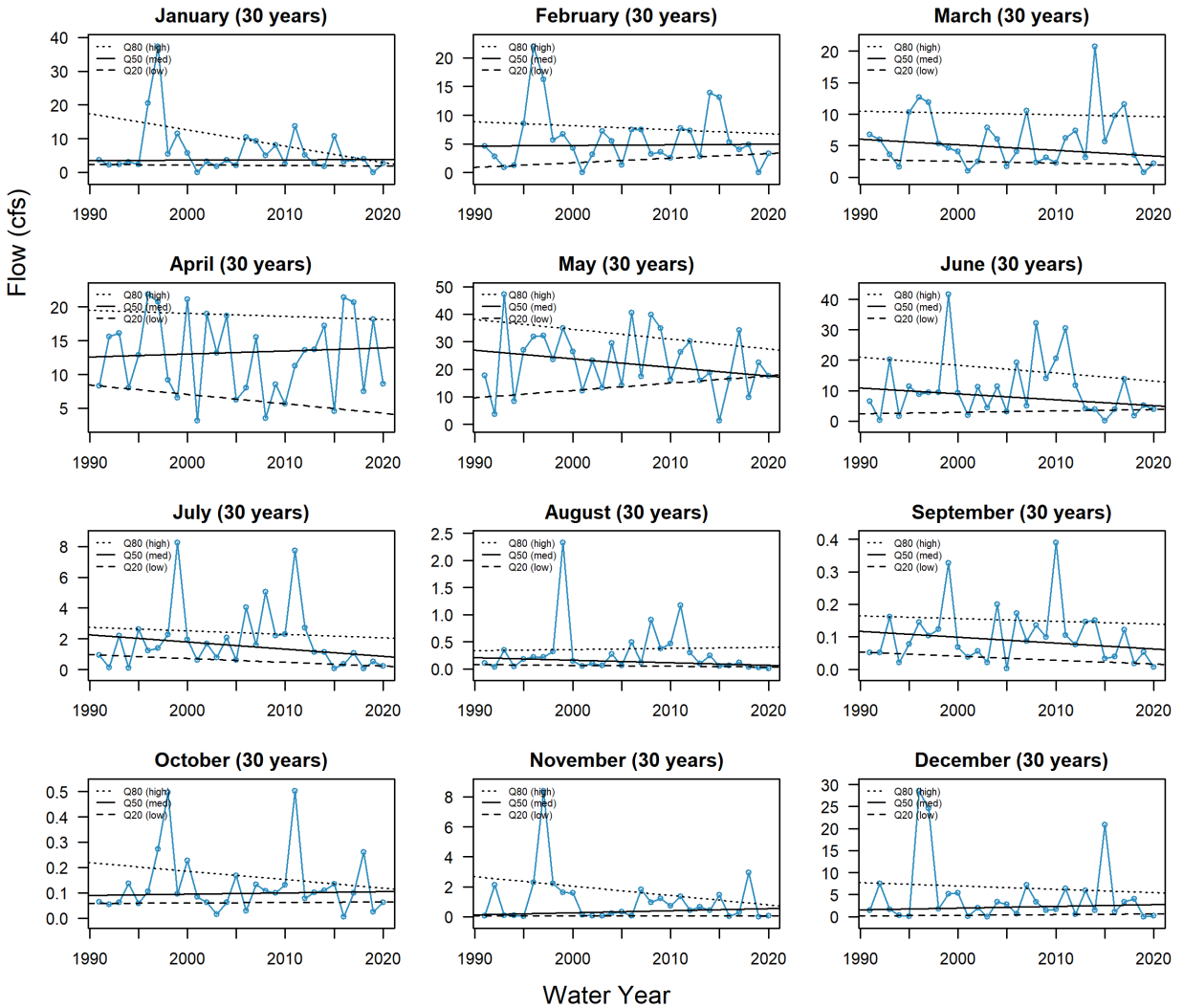
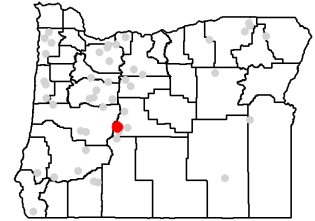


Base-period Flow Trends for Station #14052000

Annual Flow at Station #14052000 (30 years, 1991-2020)

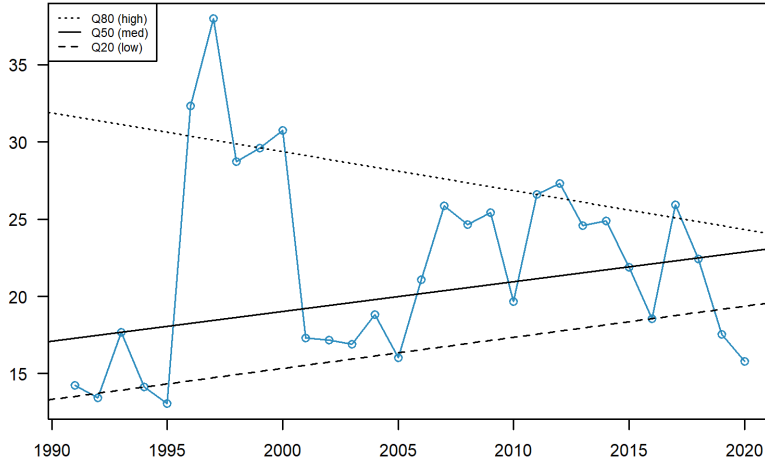


Station #14052000

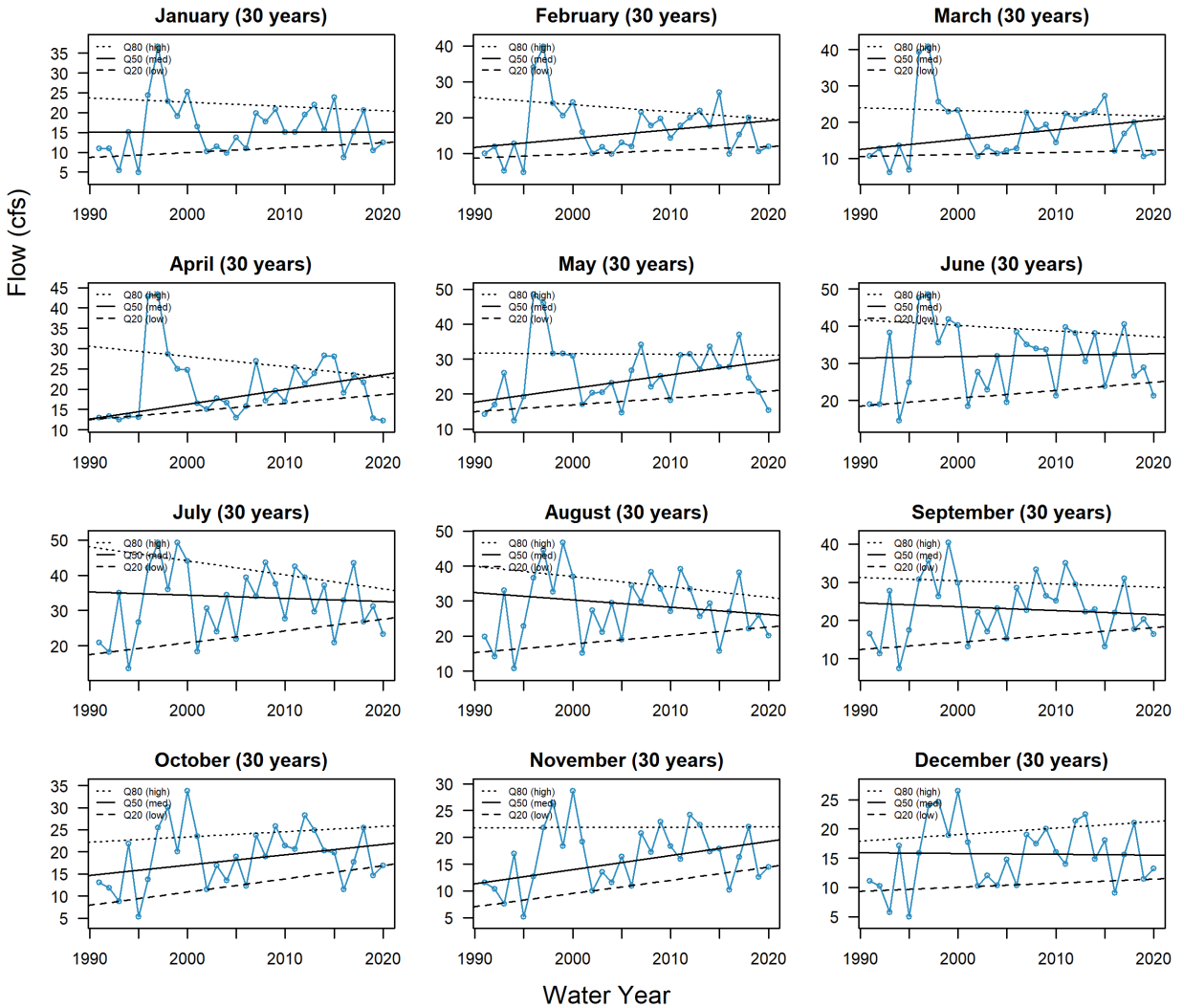
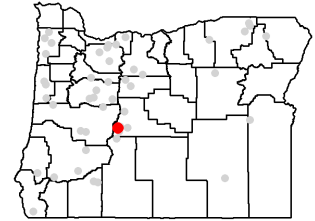


Base-period Flow Trends for Station #14052500

Annual Flow at Station #14052500 (30 years, 1991-2020)

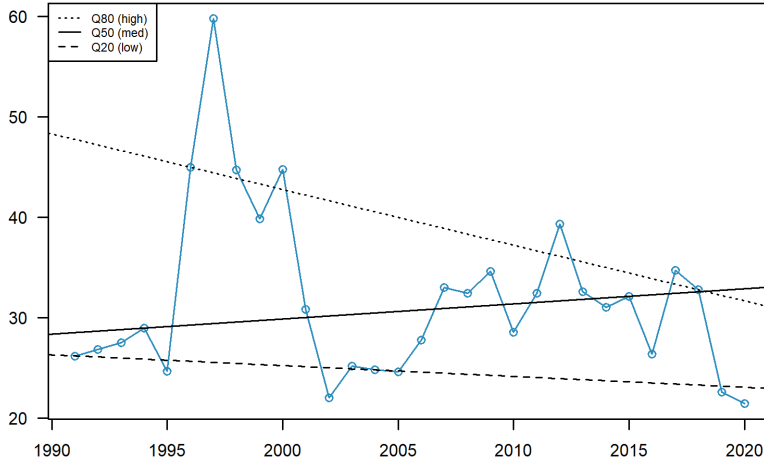


Station #14052500

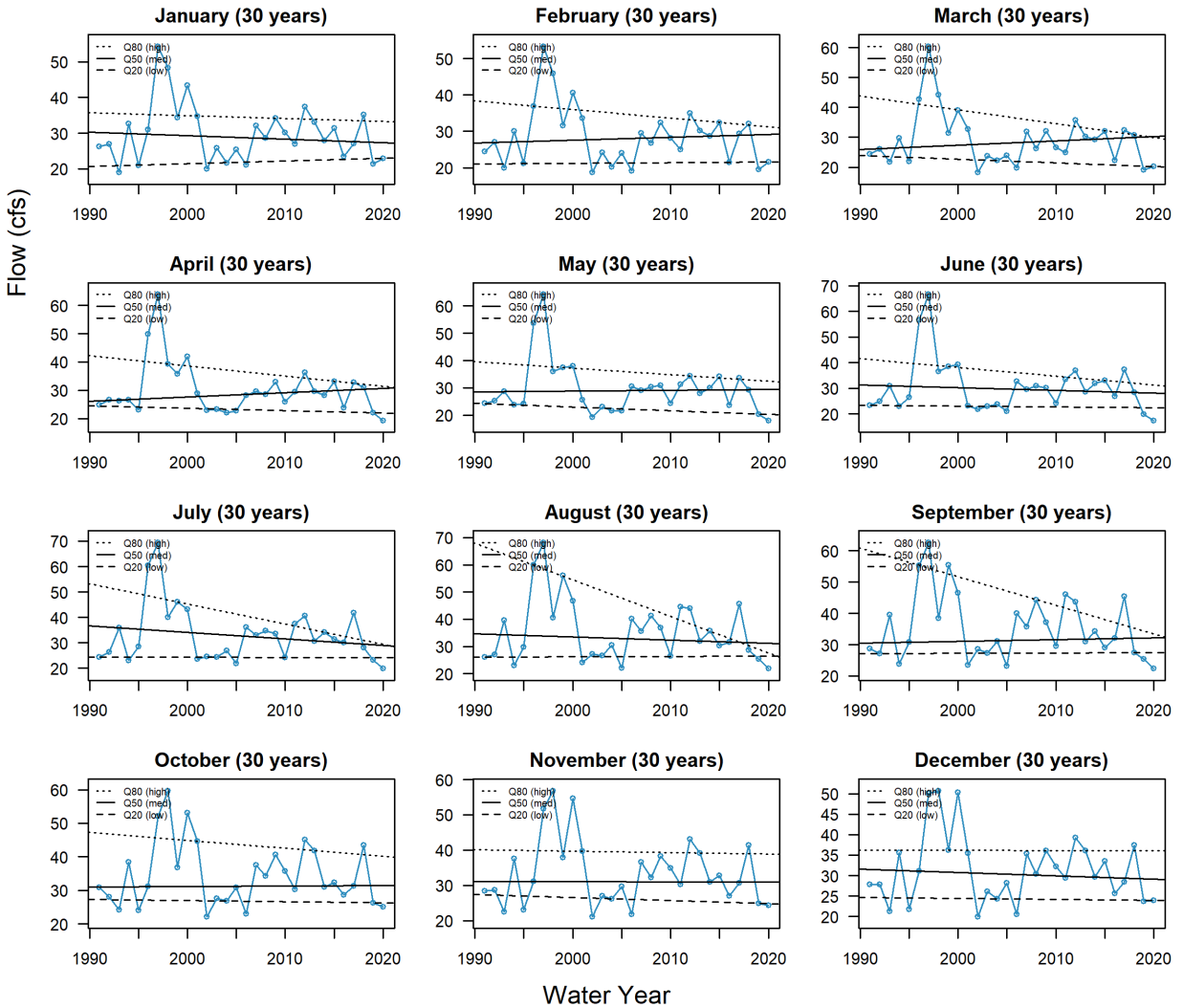
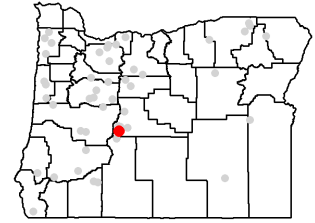


Base-period Flow Trends for Station #14054500

Annual Flow at Station #14054500 (30 years, 1991-2020)

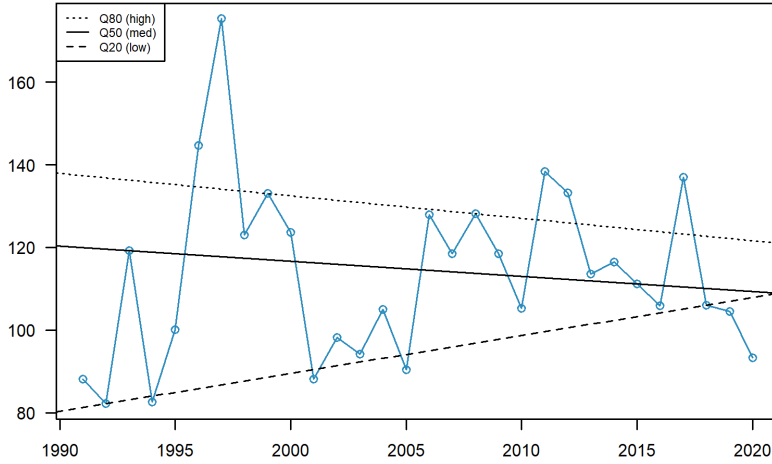


Station #14054500

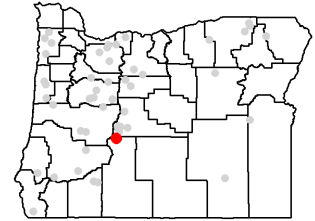


Base-period Flow Trends for Station #14055600

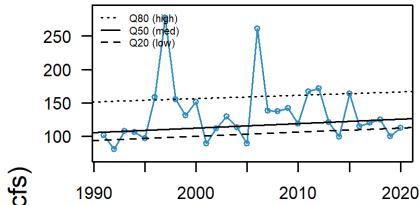
Annual Flow at Station #14055600 (30 years, 1991-2020)



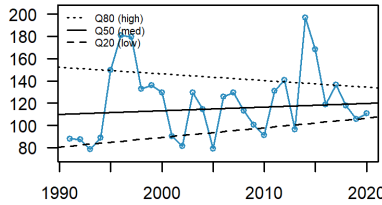
Station #14055600



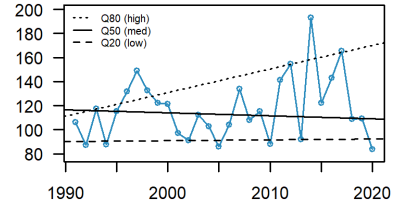
January (30 years)



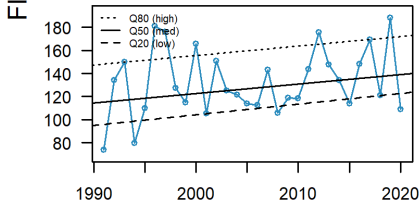
February (30 years)



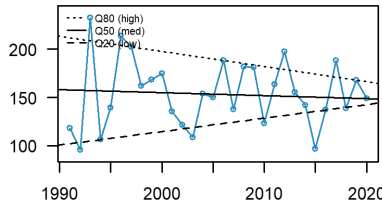
March (30 years)



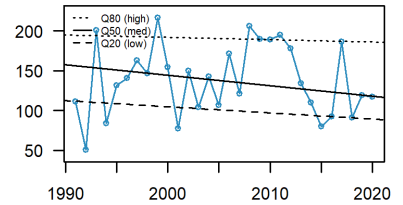
April (30 years)



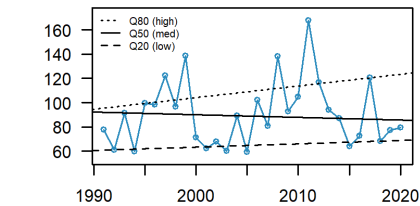
May (30 years)



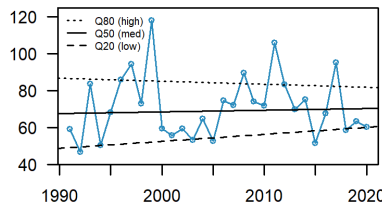
June (30 years)



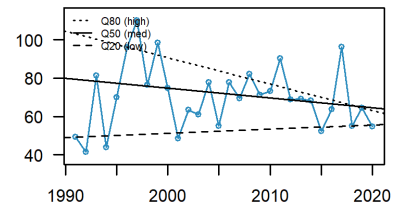
July (30 years)



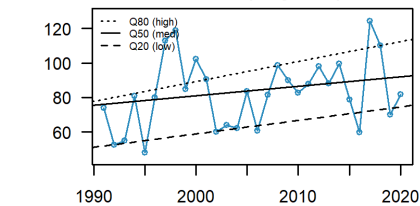
August (30 years)



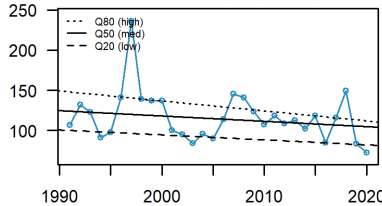
September (30 years)



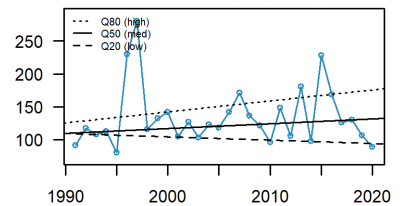
October (30 years)



November (30 years)



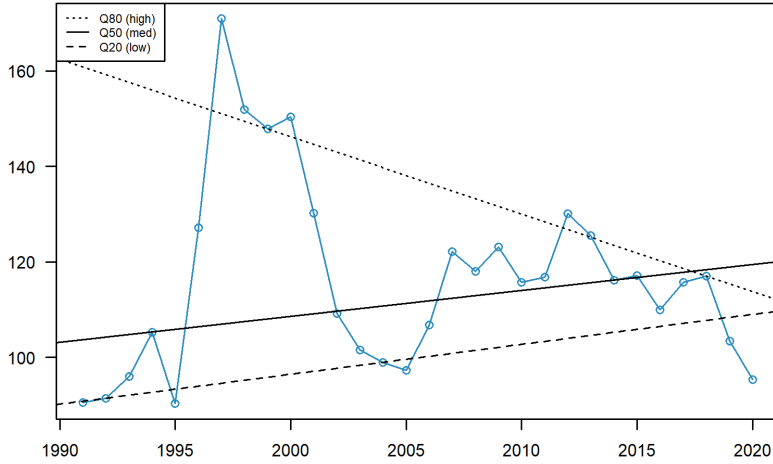
December (30 years)



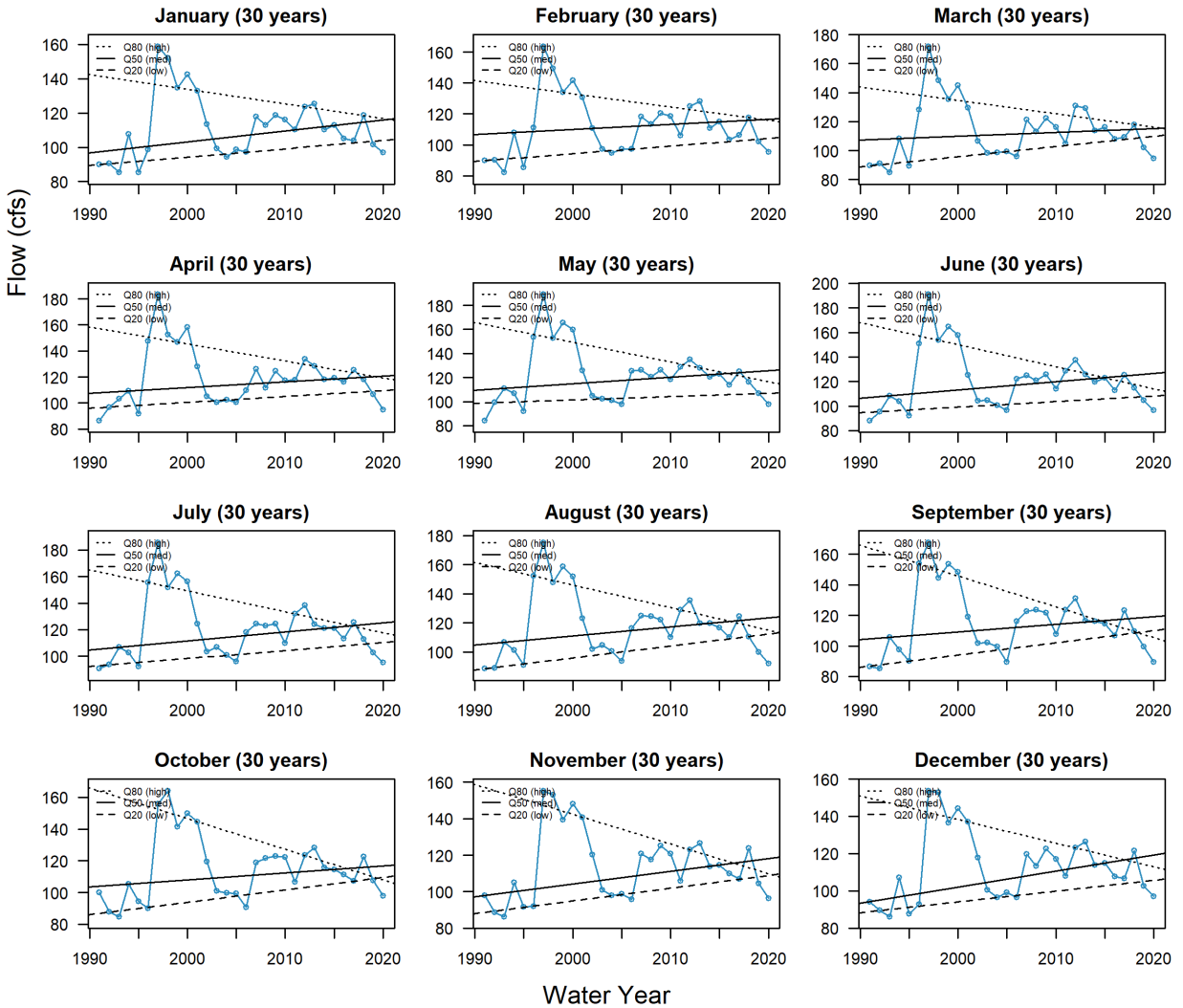
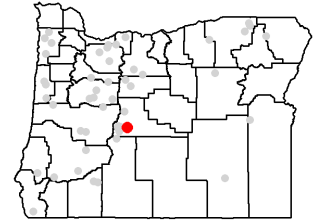
Water Year

Base-period Flow Trends for Station #14057500

Annual Flow at Station #14057500 (30 years, 1991-2020)

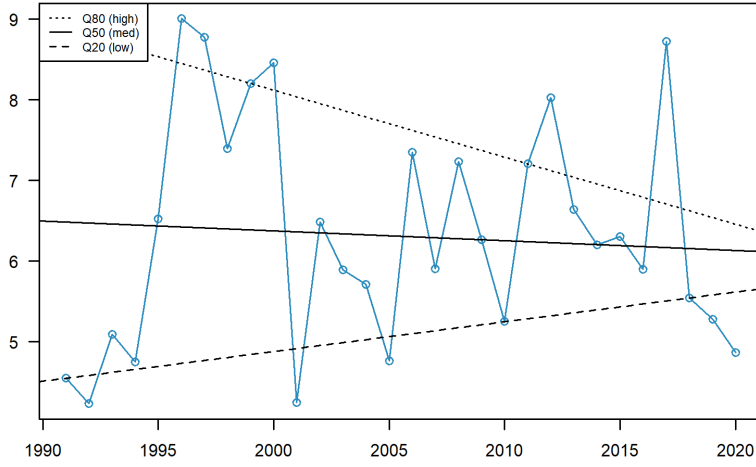


Station #14057500

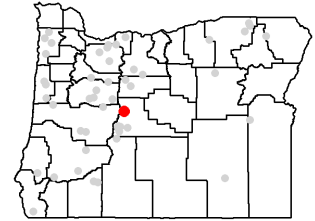


Base-period Flow Trends for Station #14074900

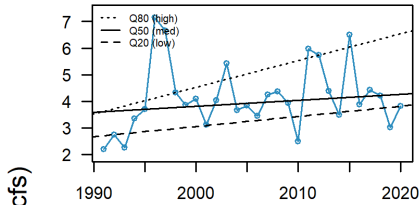
Annual Flow at Station #14074900 (30 years, 1991-2020)



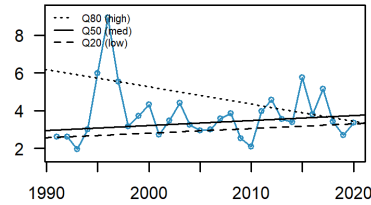
Station #14074900



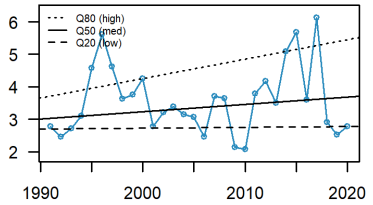
January (30 years)



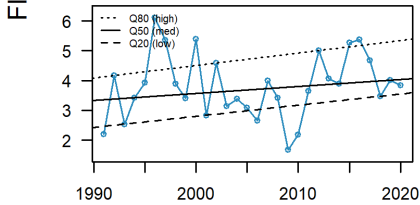
February (30 years)



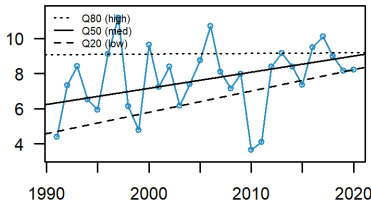
March (30 years)



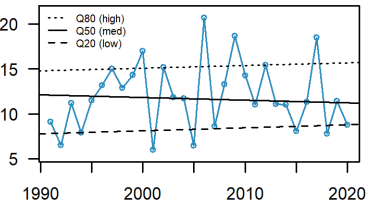
April (30 years)



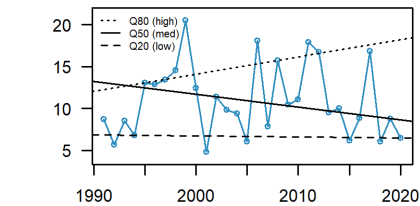
May (30 years)



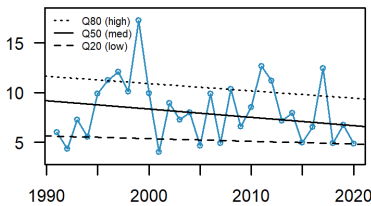
June (30 years)



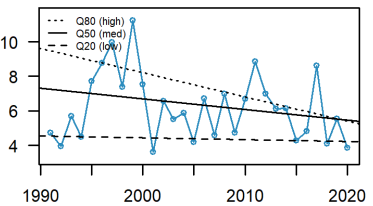
July (30 years)



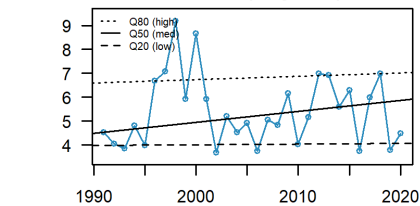
August (30 years)



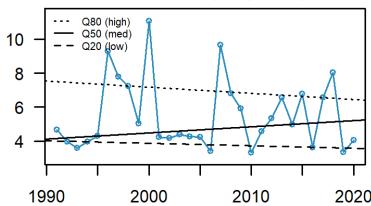
September (30 years)



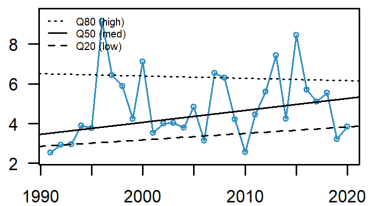
October (30 years)



November (30 years)



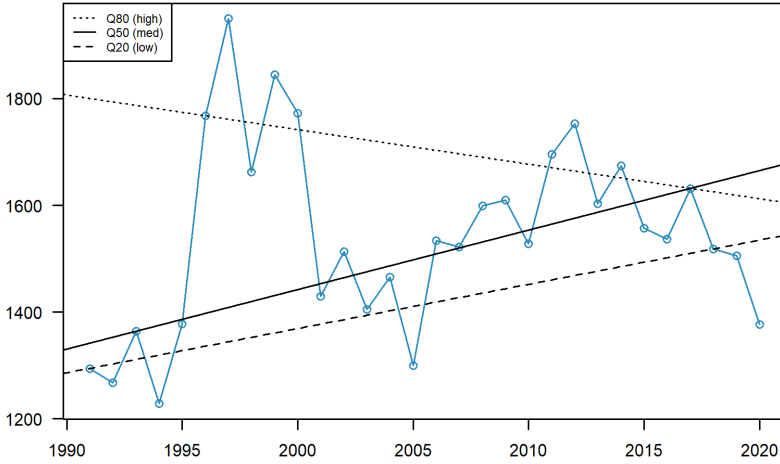
December (30 years)



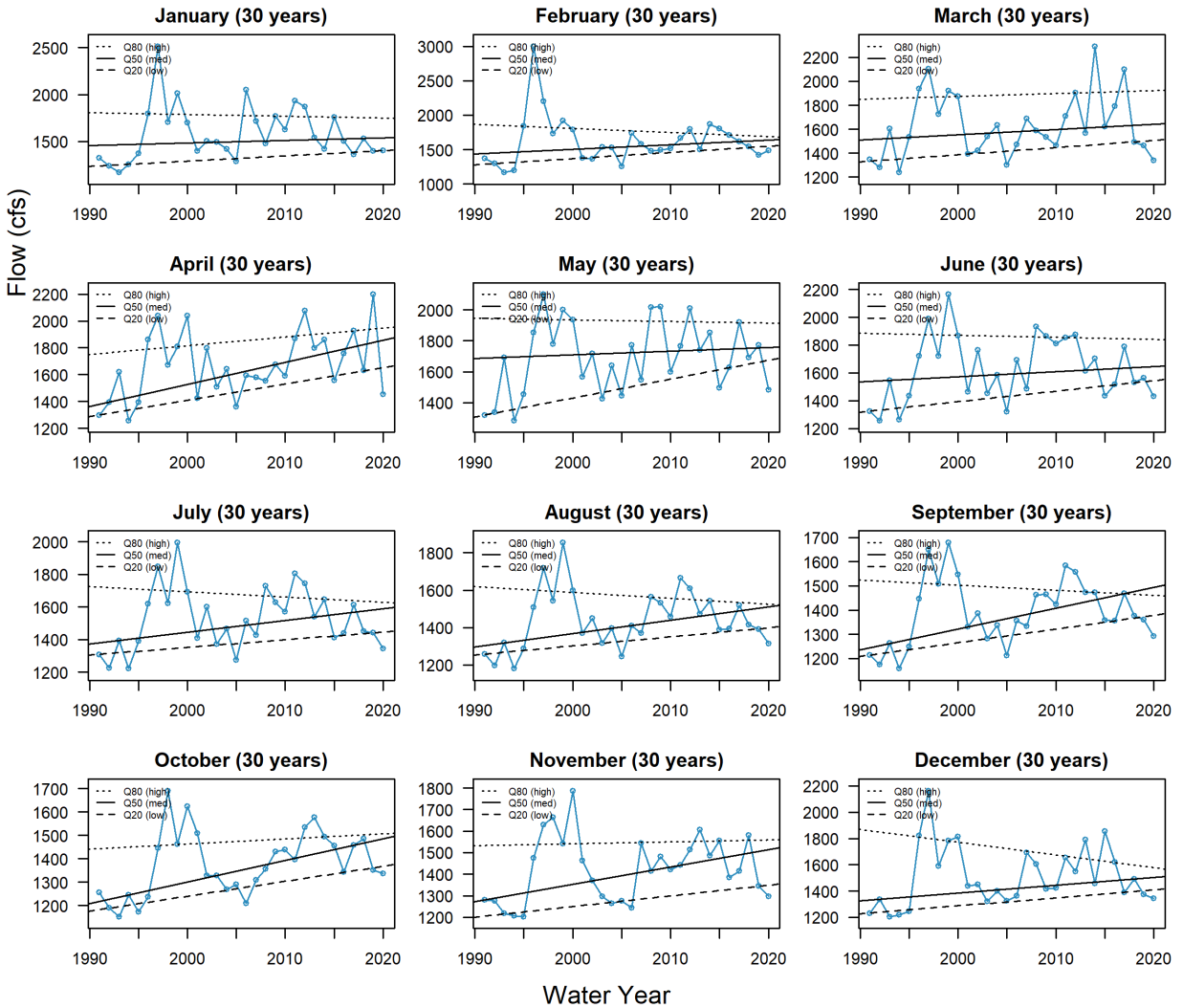
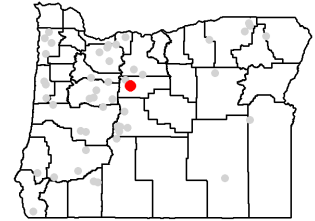
Water Year

Base-period Flow Trends for Station #14091500

Annual Flow at Station #14091500 (30 years, 1991-2020)

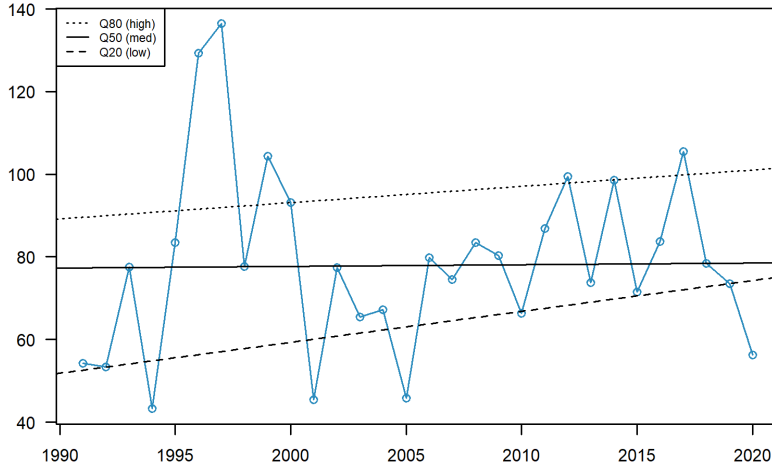


Station #14091500

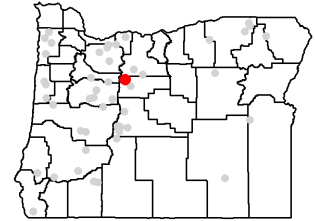


Base-period Flow Trends for Station #14092750

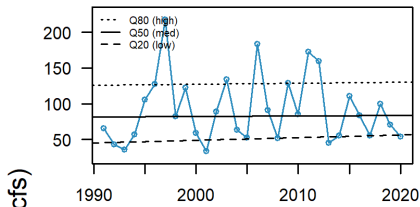
Annual Flow at Station #14092750 (30 years, 1991-2020)



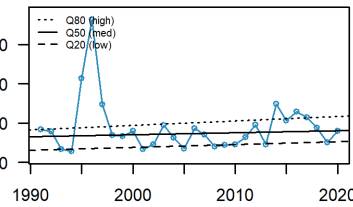
Station #14092750



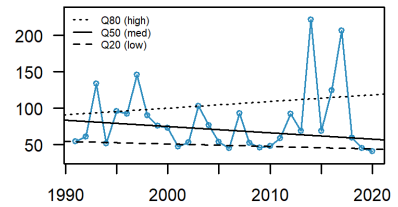
January (30 years)



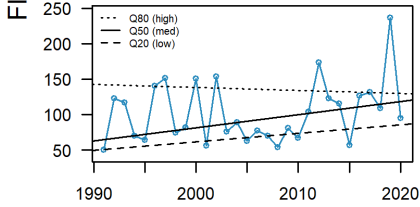
February (30 years)



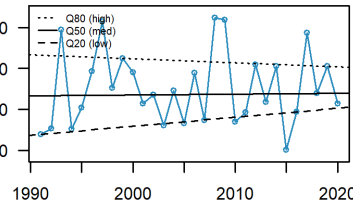
March (30 years)



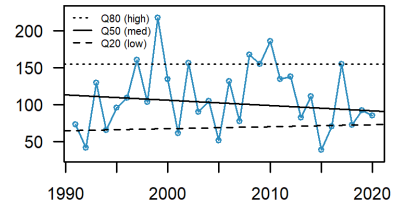
April (30 years)



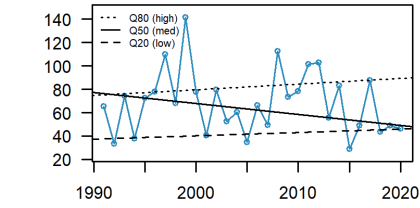
May (30 years)



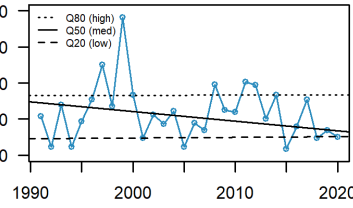
June (30 years)



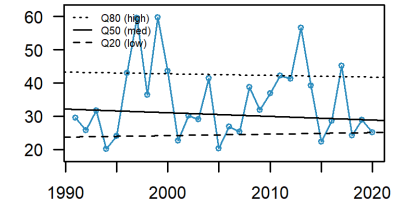
July (30 years)



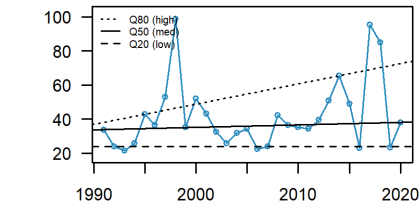
August (30 years)



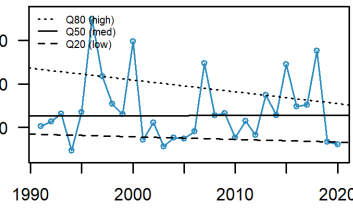
September (30 years)



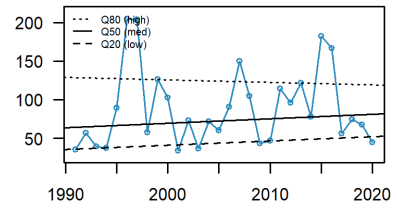
October (30 years)



November (30 years)



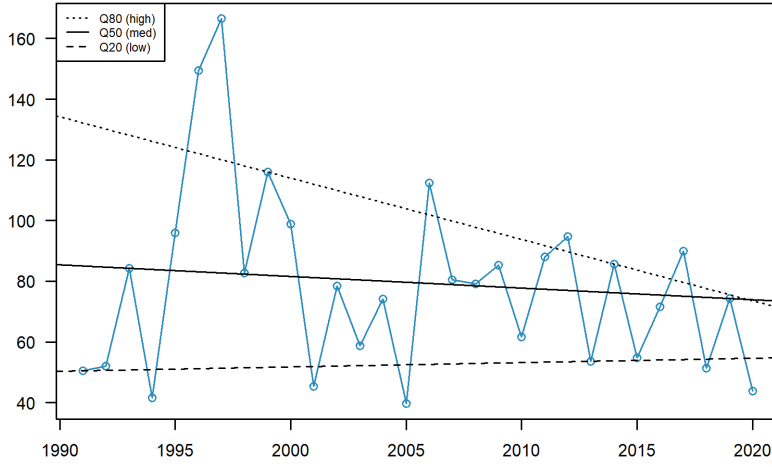
December (30 years)



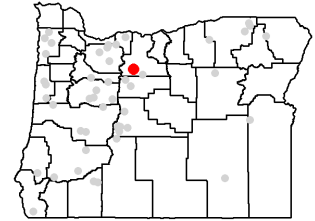
Water Year

Base-period Flow Trends for Station #14096850

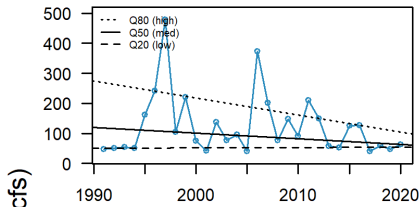
Annual Flow at Station #14096850 (30 years, 1991-2020)



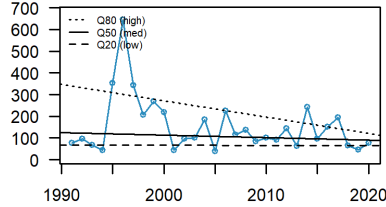
Station #14096850



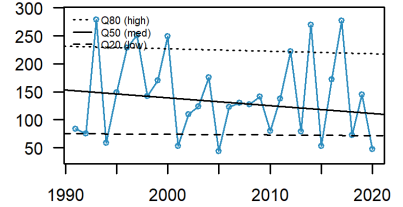
January (30 years)



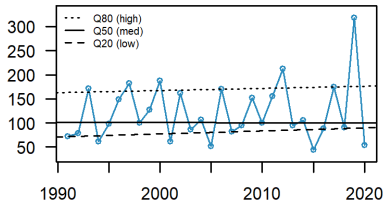
February (30 years)



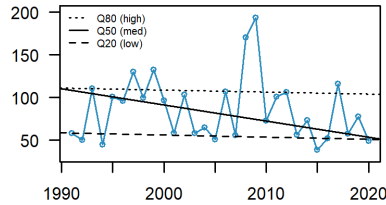
March (30 years)



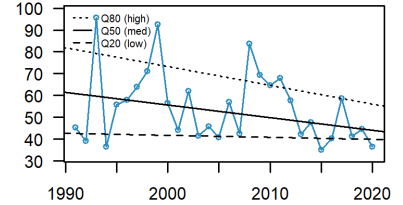
April (30 years)



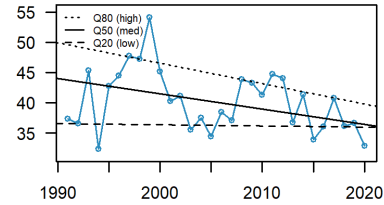
May (30 years)



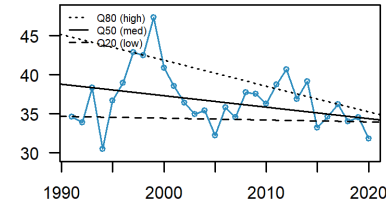
June (30 years)



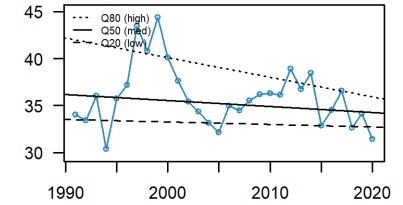
July (30 years)



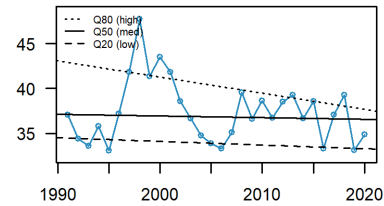
August (30 years)



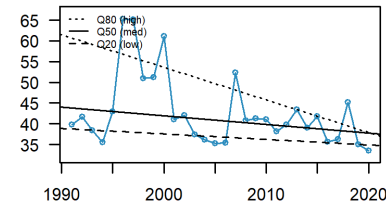
September (30 years)



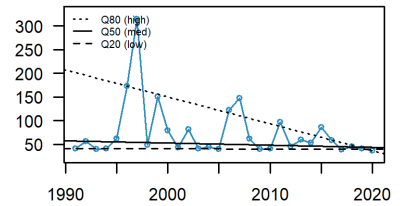
October (30 years)



November (30 years)



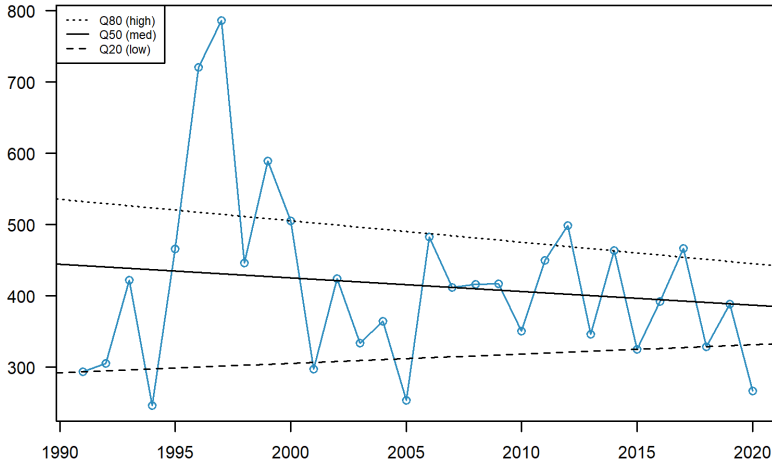
December (30 years)



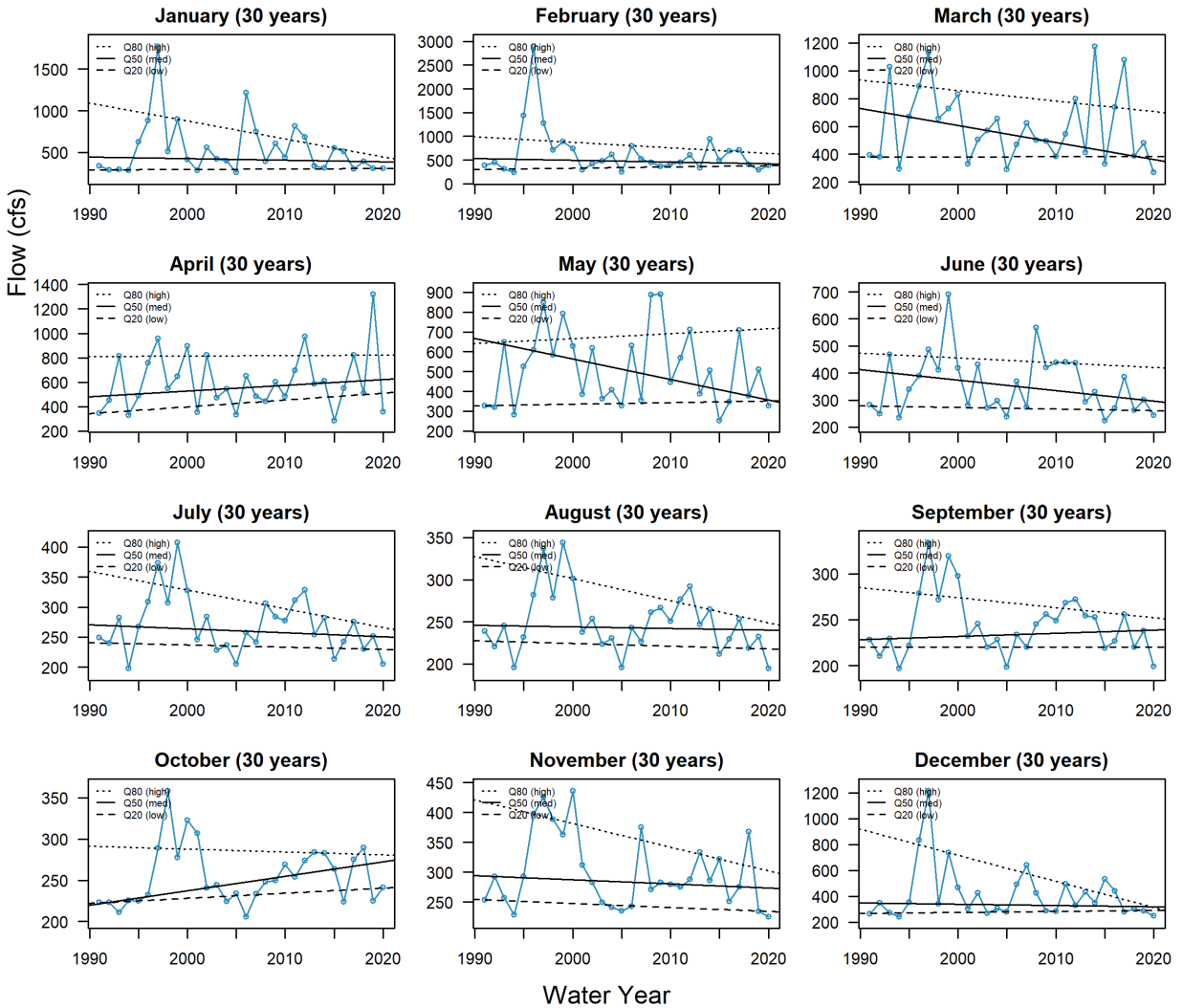
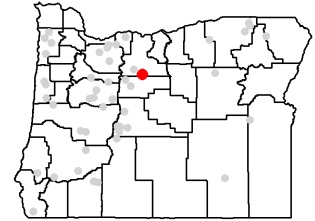
Water Year

Base-period Flow Trends for Station #14097100

Annual Flow at Station #14097100 (30 years, 1991-2020)

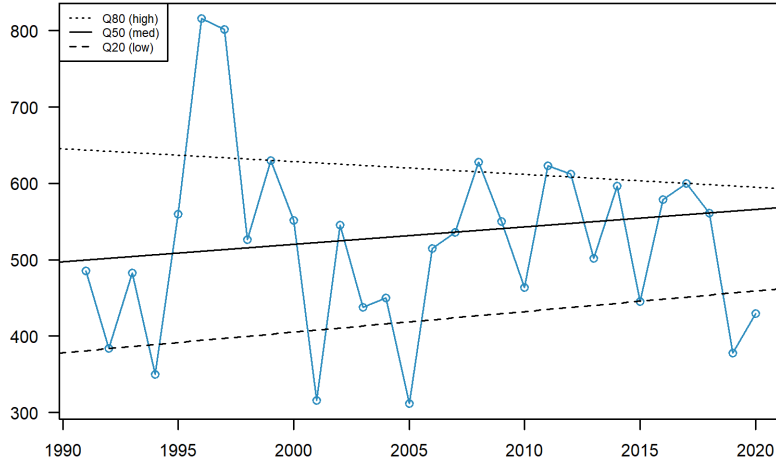


Station #14097100

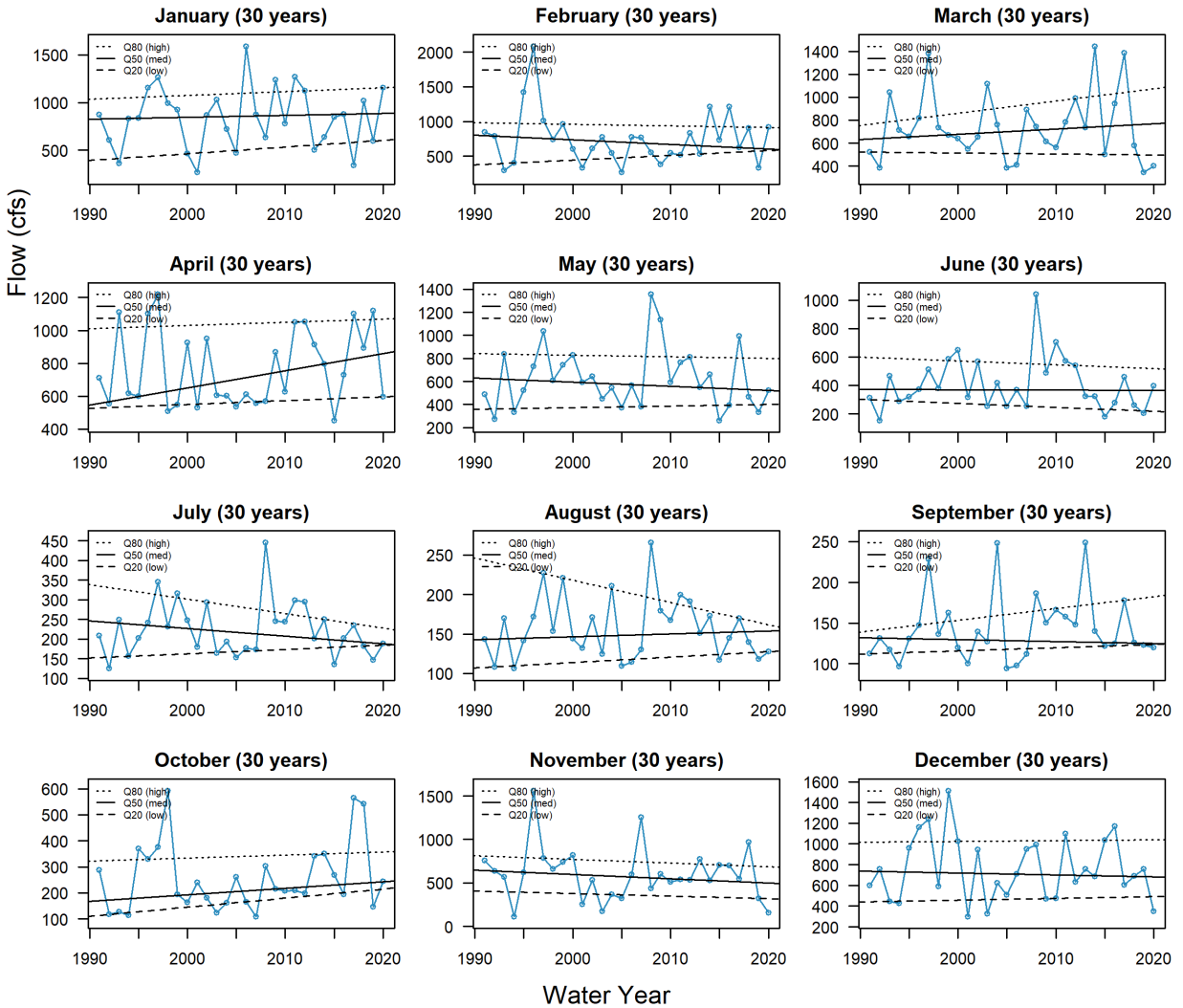
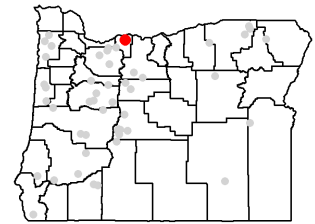


Base-period Flow Trends for Station #14118500

Annual Flow at Station #14118500 (30 years, 1991-2020)

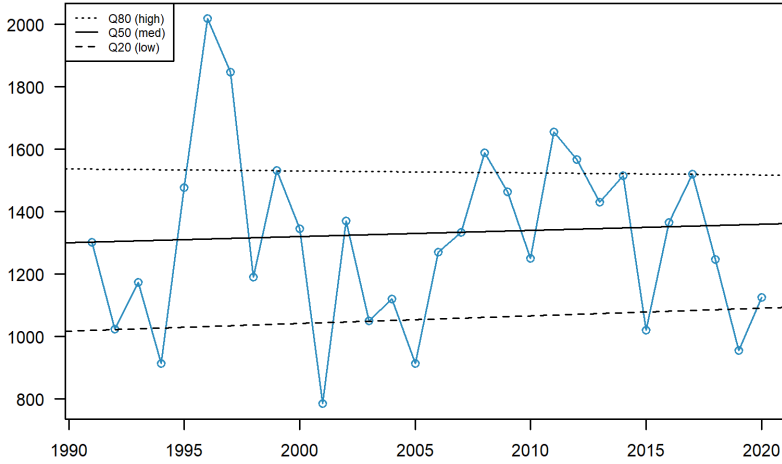


Station #14118500

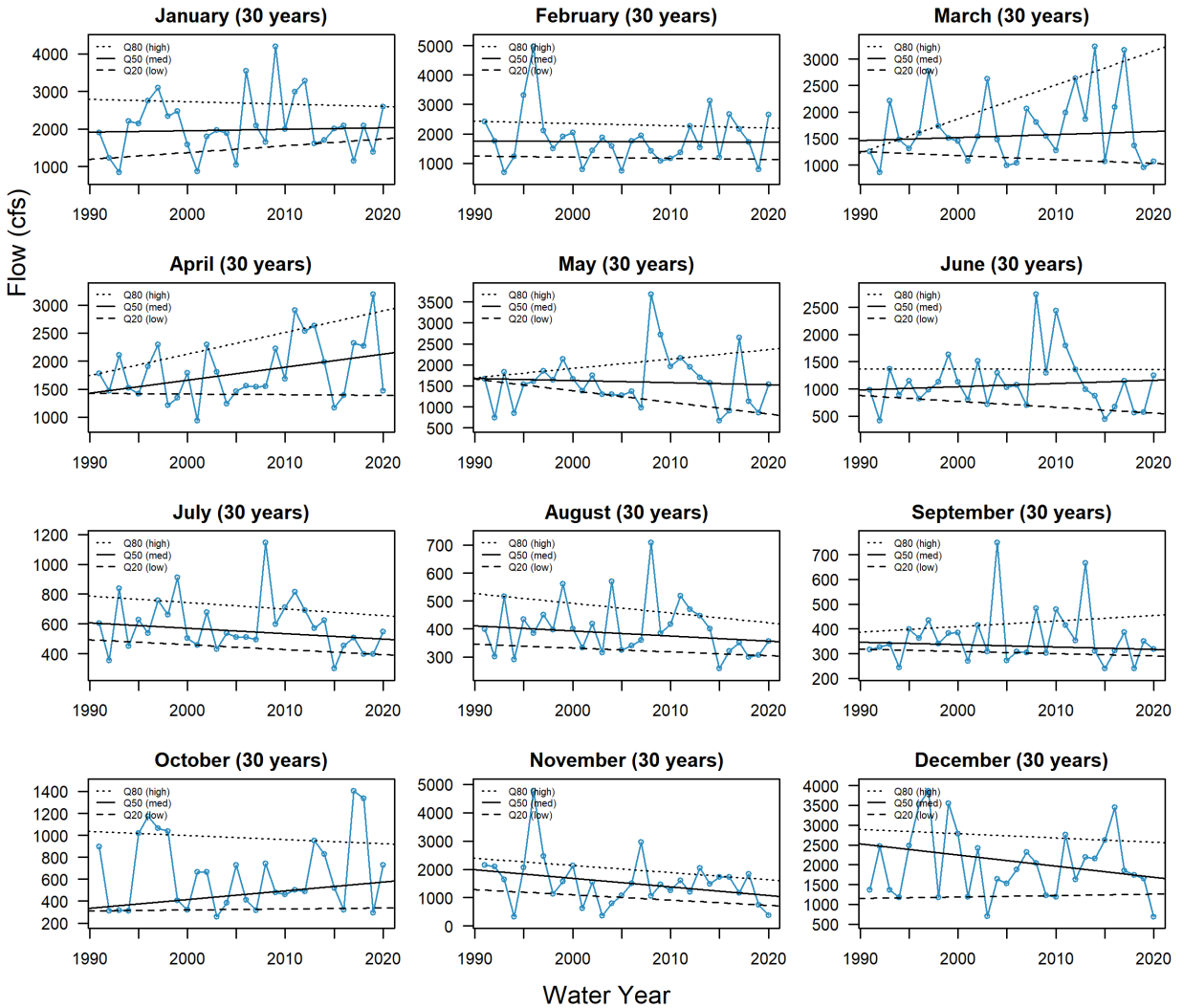
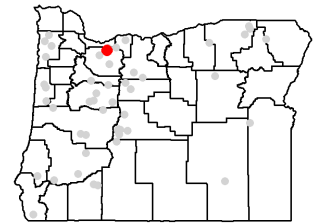


Base-period Flow Trends for Station #14137000

Annual Flow at Station #14137000 (30 years, 1991-2020)

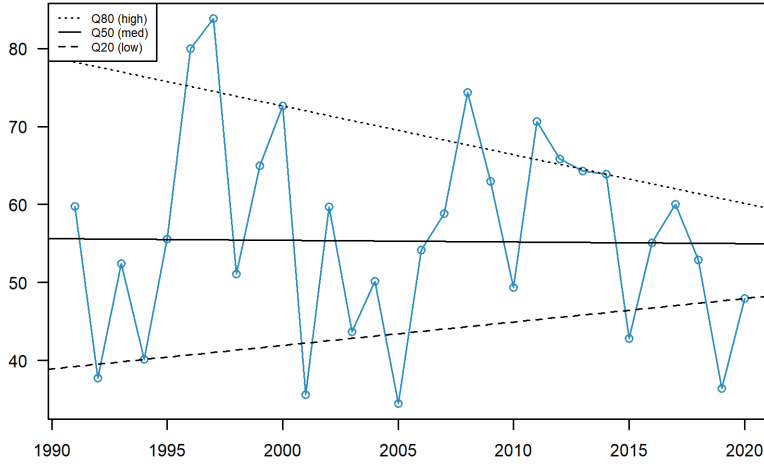


Station #14137000

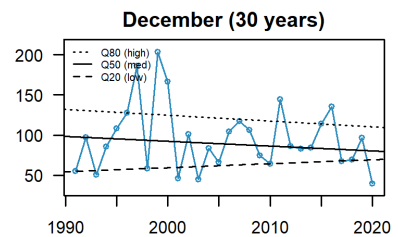
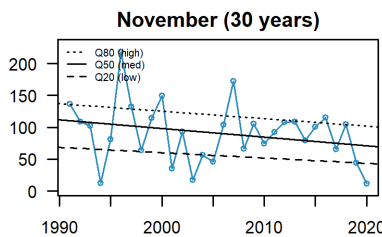
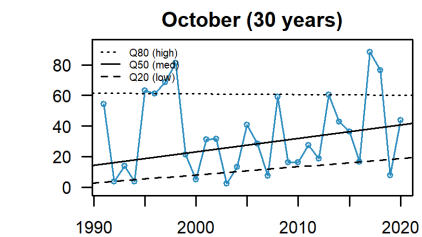
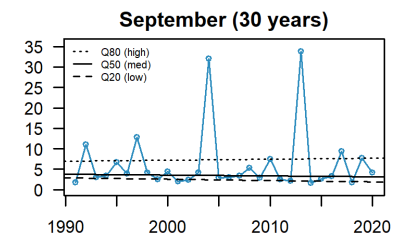
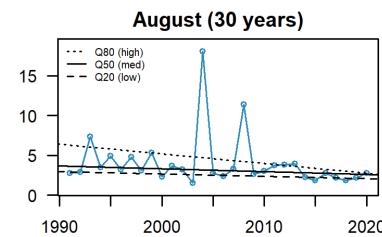
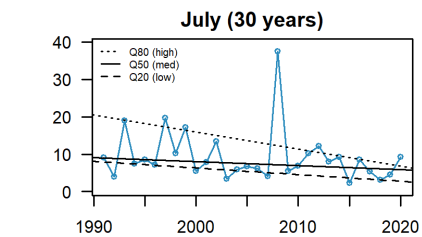
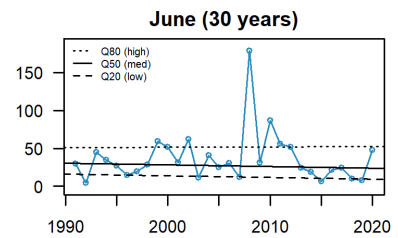
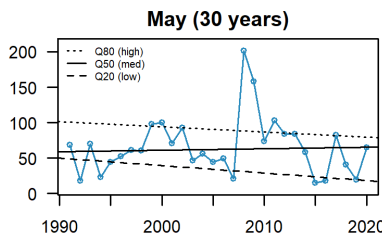
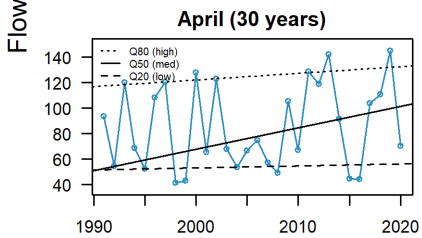
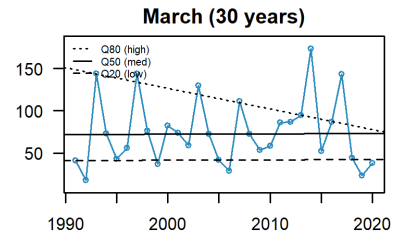
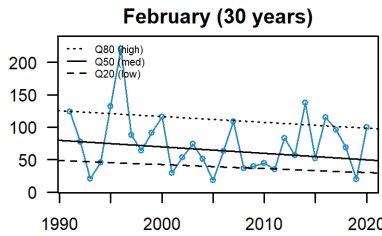
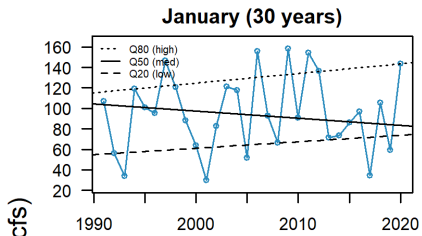
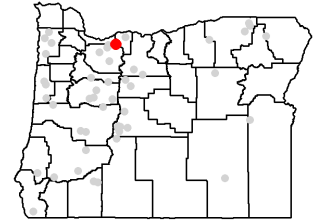


Base-period Flow Trends for Station #14138800

Annual Flow at Station #14138800 (30 years, 1991-2020)



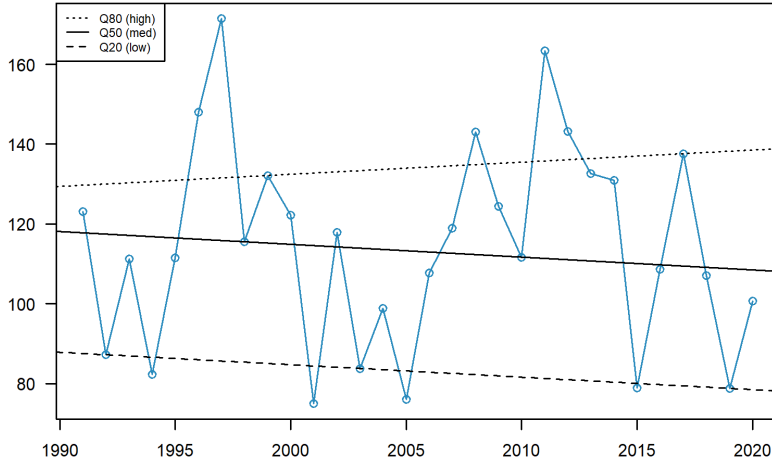
Station #14138800



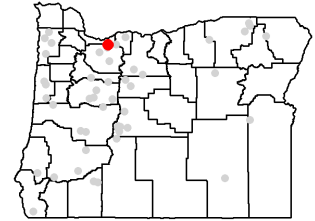
Water Year

Base-period Flow Trends for Station #14139800

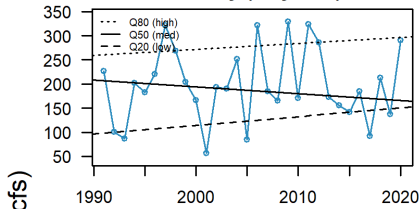
Annual Flow at Station #14139800 (30 years, 1991-2020)



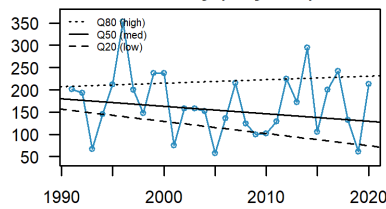
Station #14139800



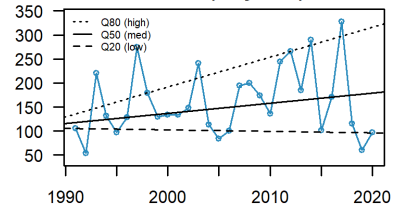
January (30 years)



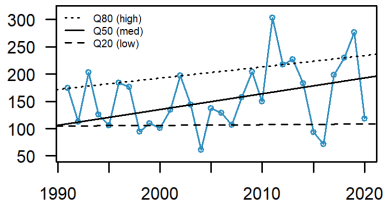
February (30 years)



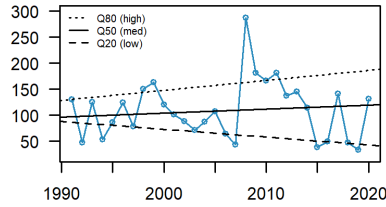
March (30 years)



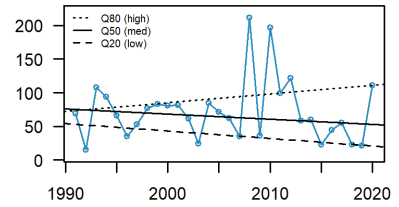
April (30 years)



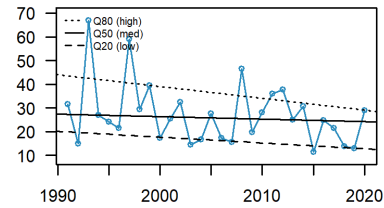
May (30 years)



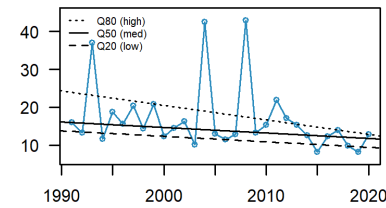
June (30 years)



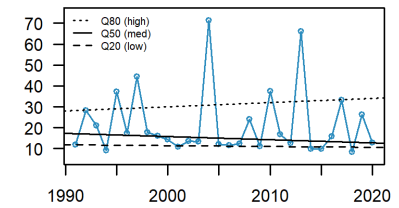
July (30 years)



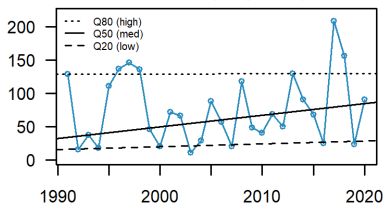
August (30 years)



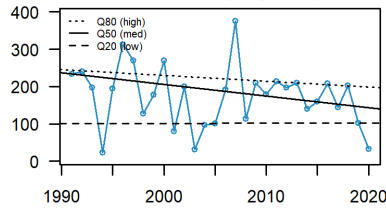
September (30 years)



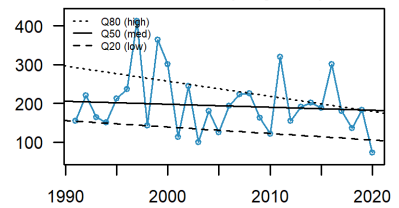
October (30 years)



November (30 years)



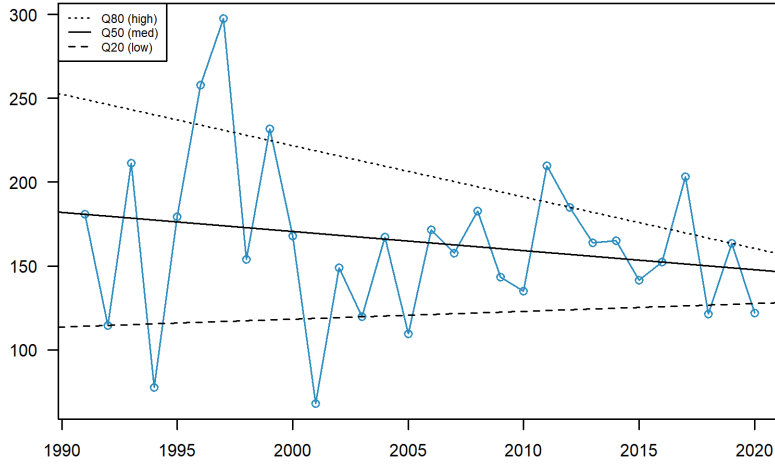
December (30 years)



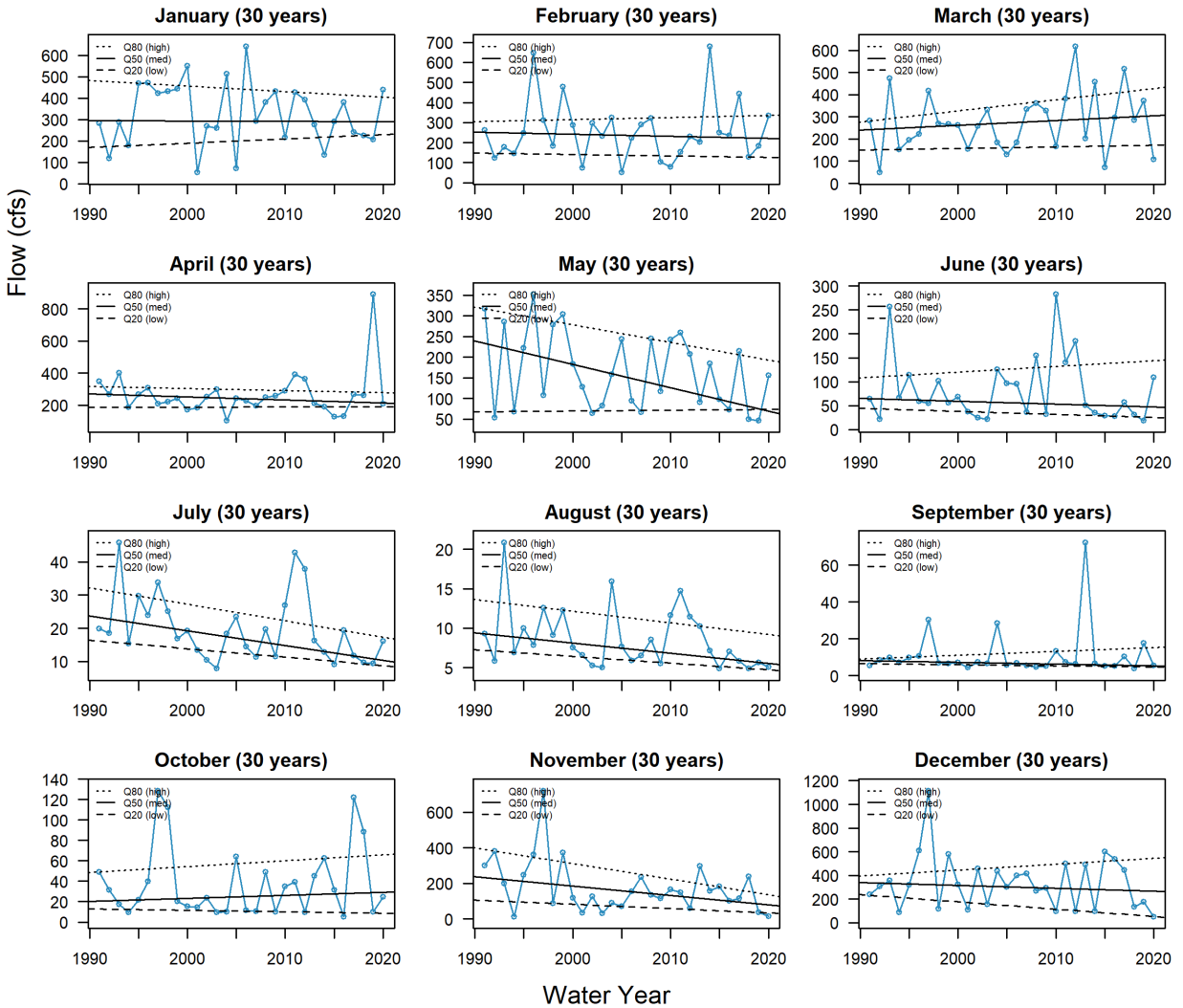
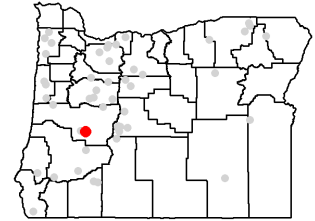
Water Year

Base-period Flow Trends for Station #14153800

Annual Flow at Station #14153800 (30 years, 1991-2020)

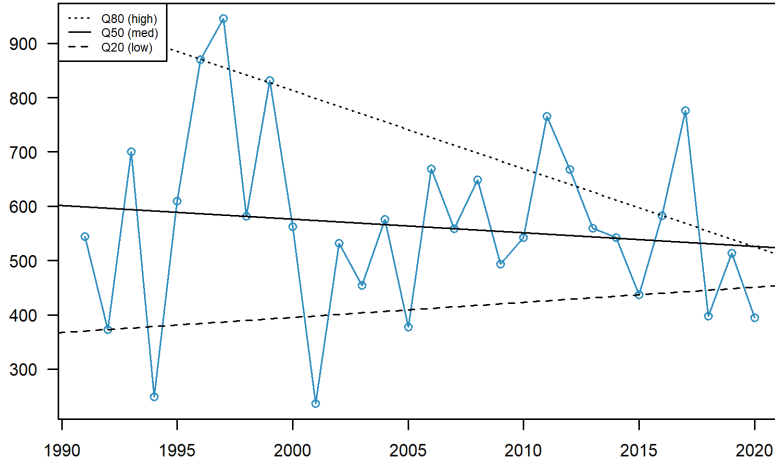


Station #14153800

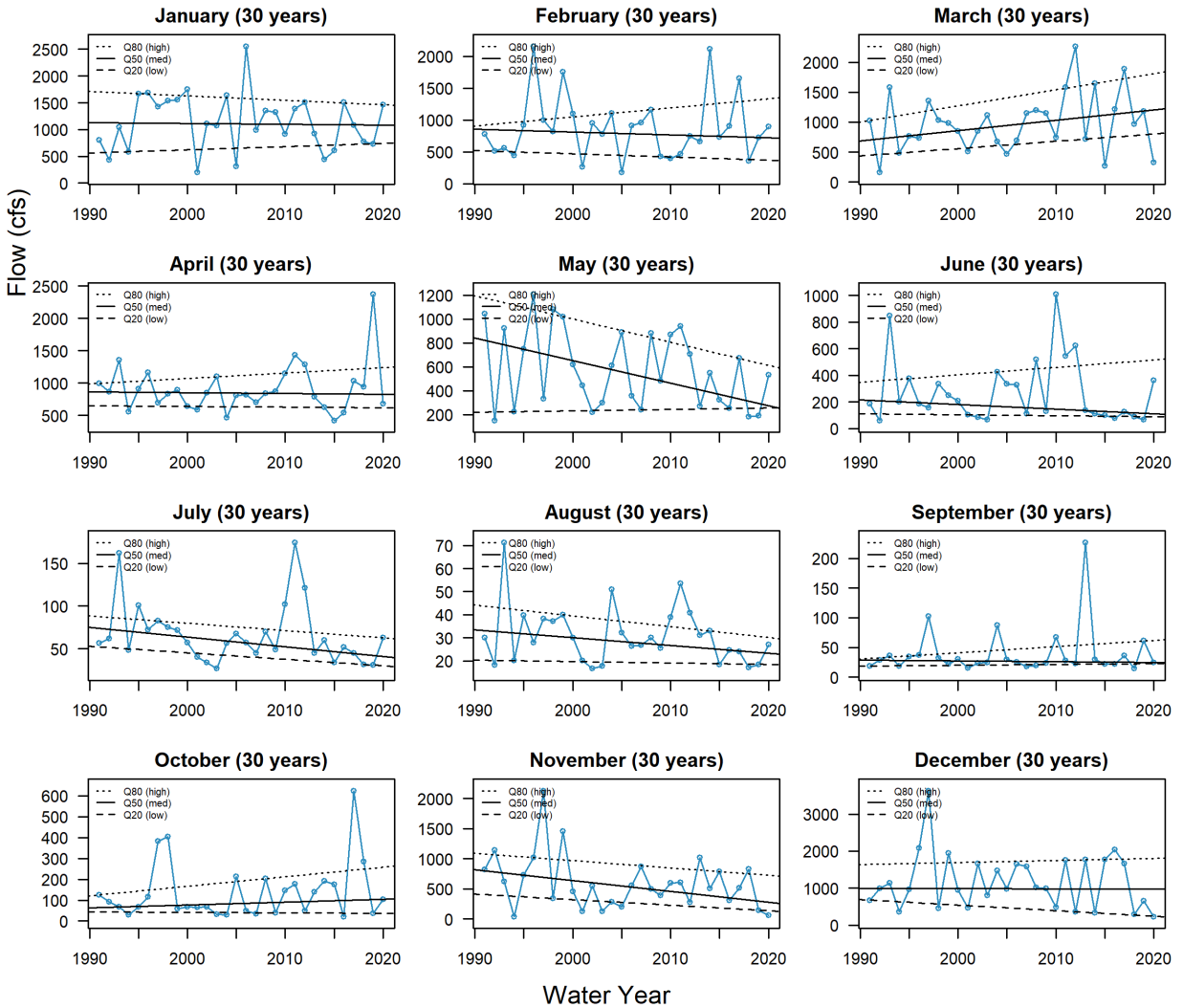
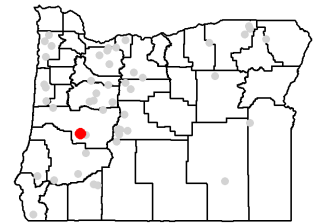


Base-period Flow Trends for Station #14154500

Annual Flow at Station #14154500 (30 years, 1991-2020)

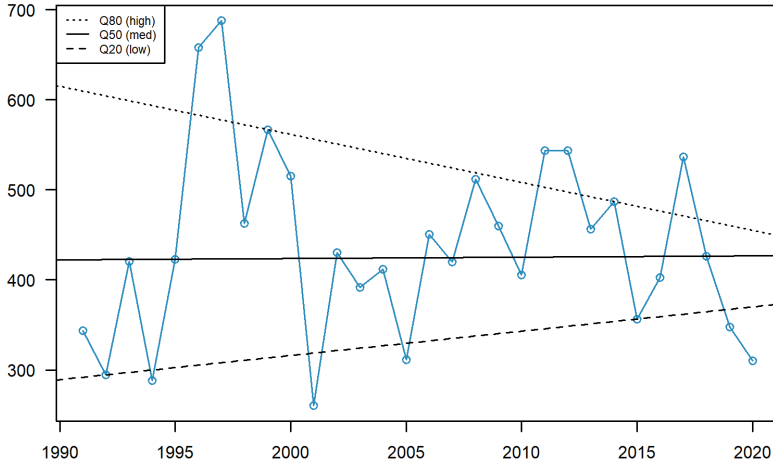


Station #14154500

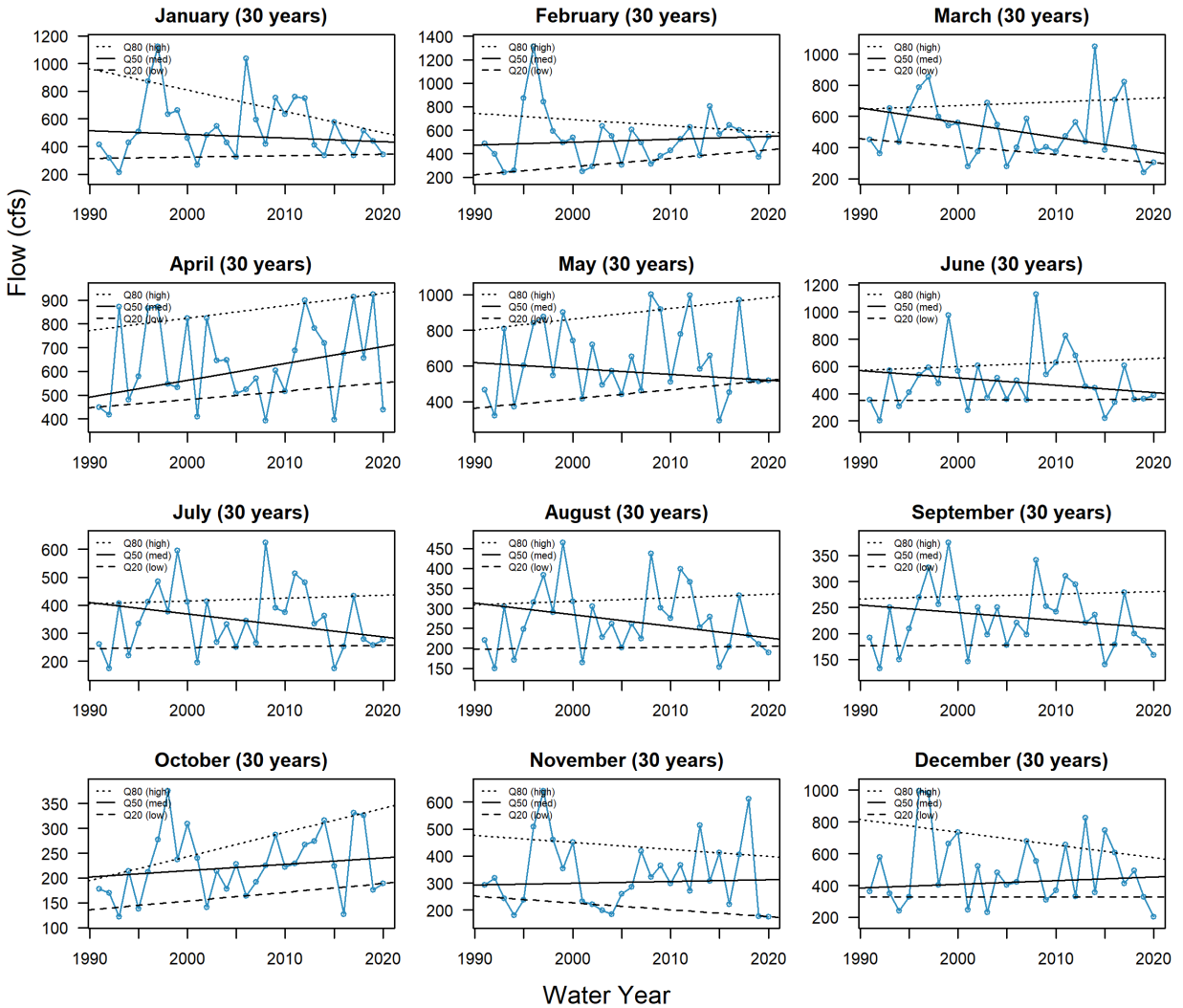
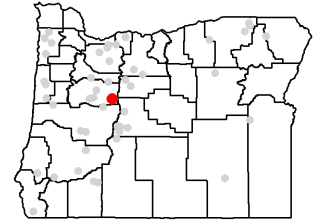


Base-period Flow Trends for Station #14158500

Annual Flow at Station #14158500 (30 years, 1991-2020)

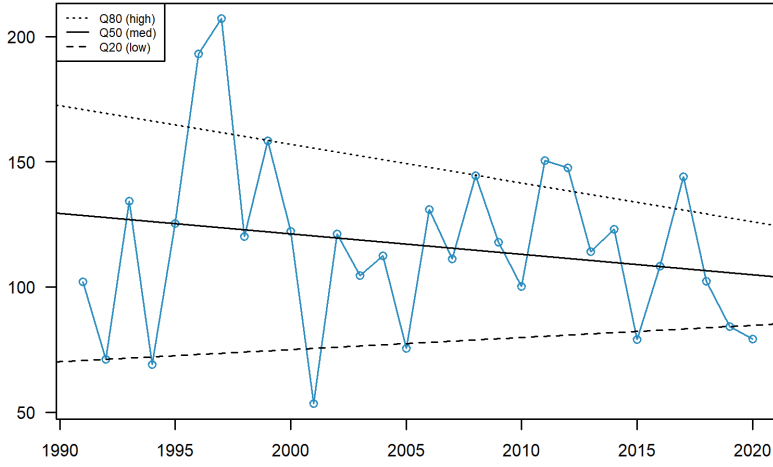


Station #14158500

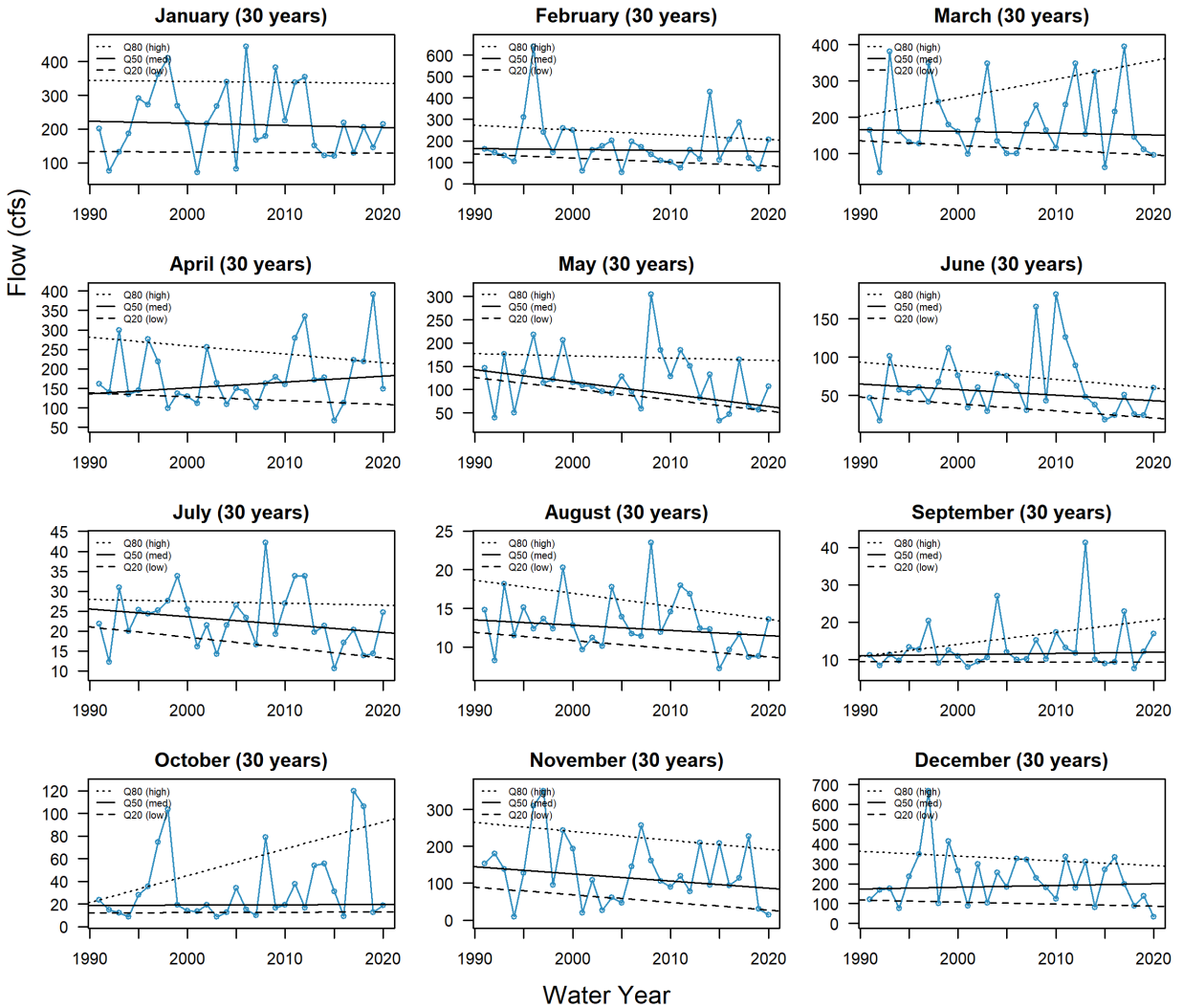
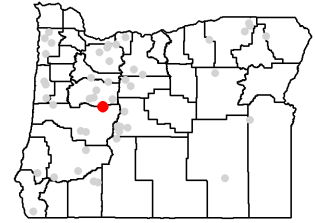


Base-period Flow Trends for Station #14161500

Annual Flow at Station #14161500 (30 years, 1991-2020)

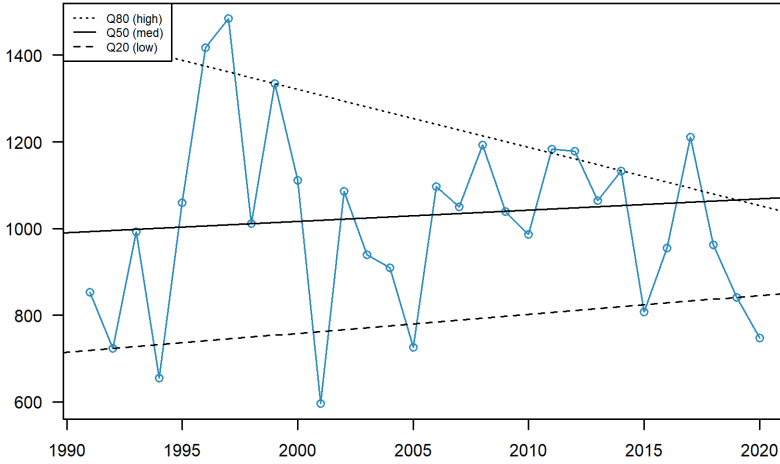


Station #14161500

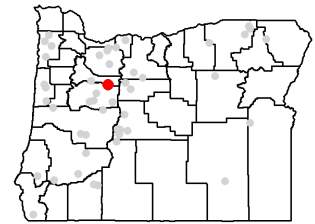


Base-period Flow Trends for Station #14178000

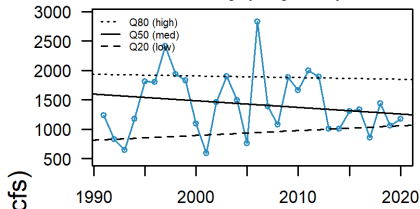
Annual Flow at Station #14178000 (30 years, 1991-2020)



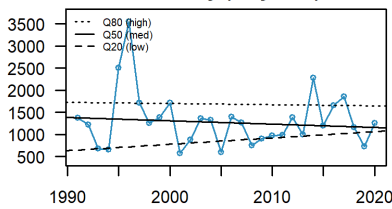
Station #14178000



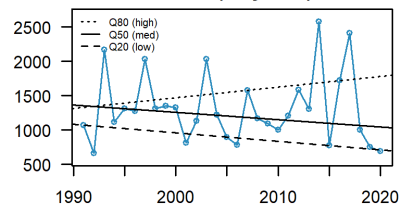
January (30 years)



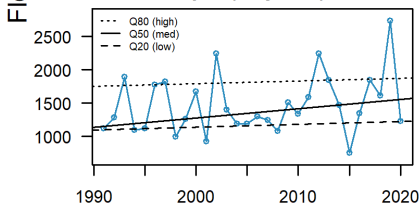
February (30 years)



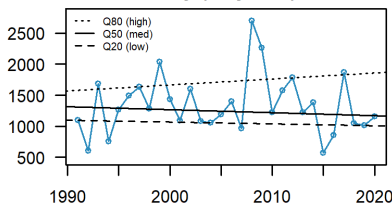
March (30 years)



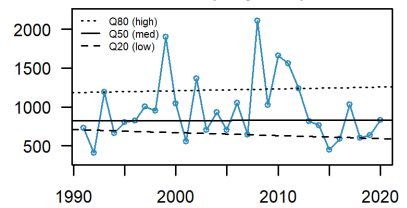
April (30 years)



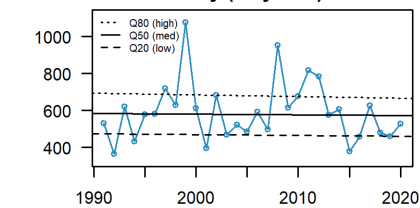
May (30 years)



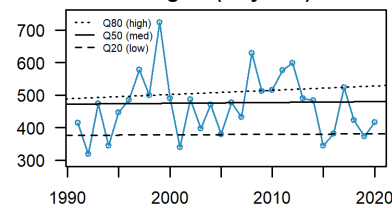
June (30 years)



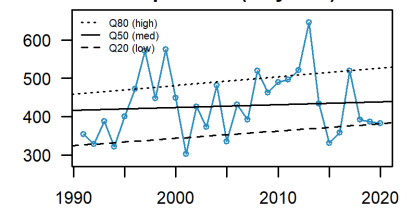
July (30 years)



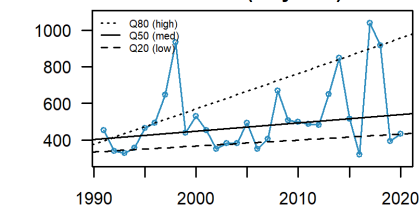
August (30 years)



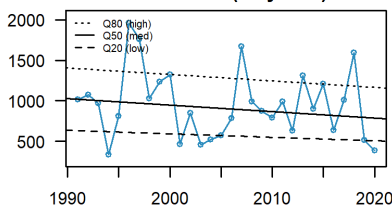
September (30 years)



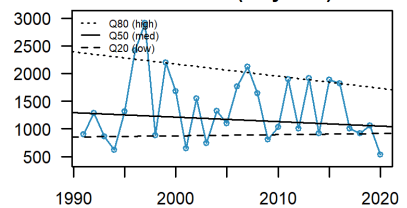
October (30 years)



November (30 years)



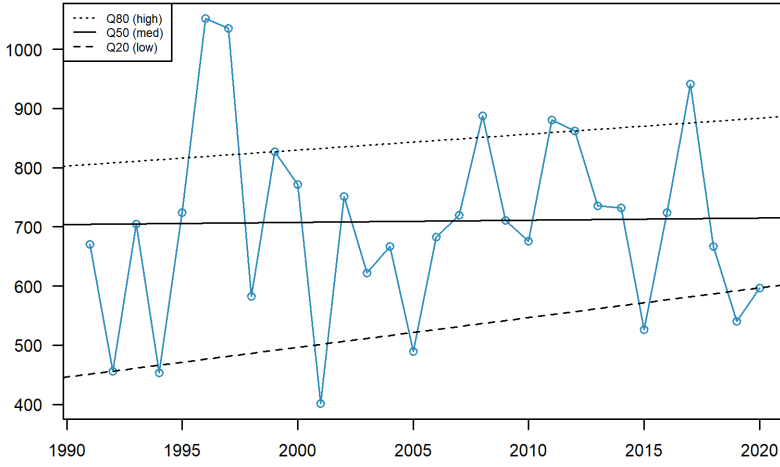
December (30 years)



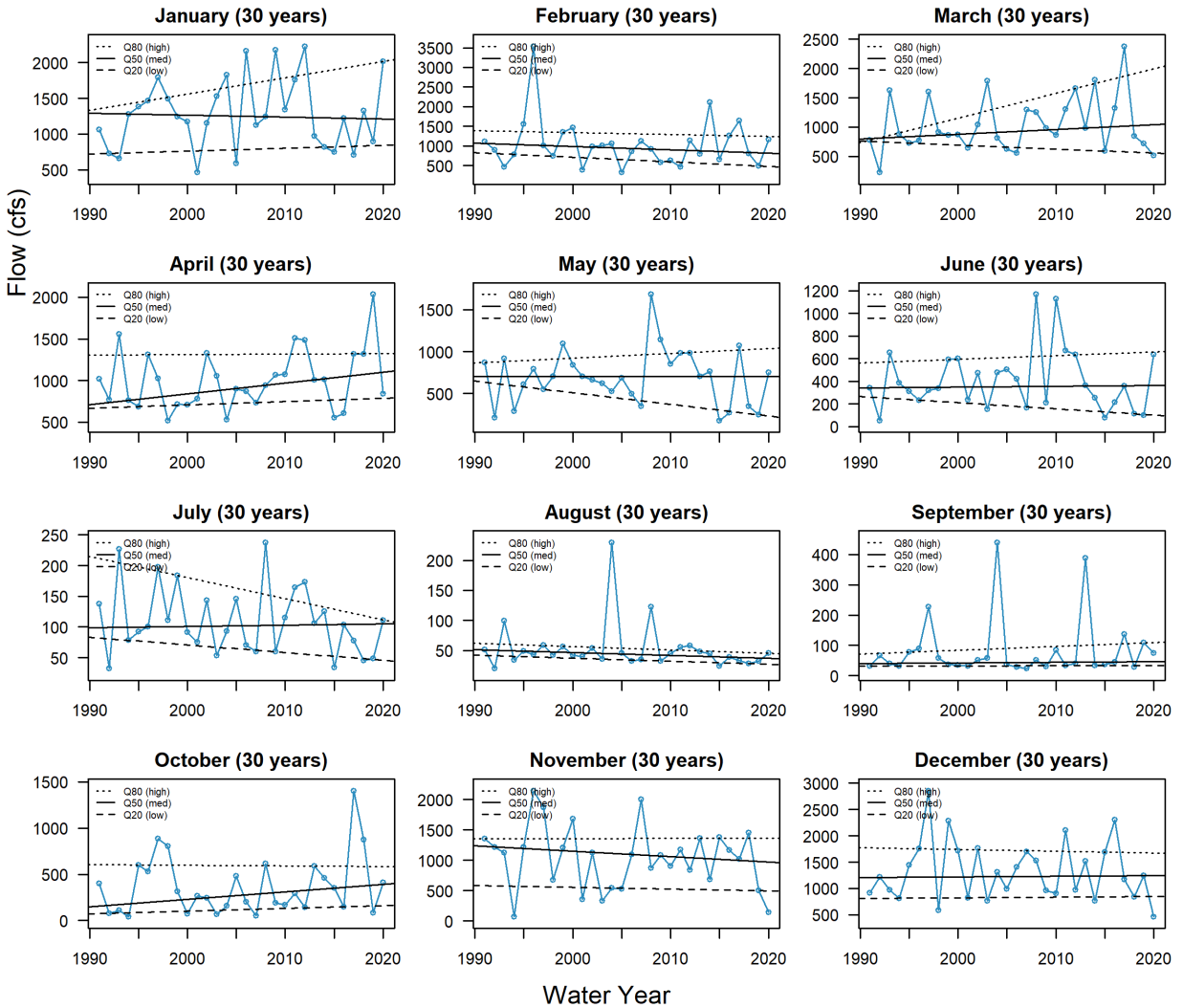
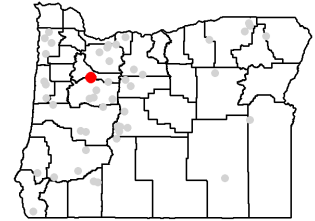
Water Year

Base-period Flow Trends for Station #14182500

Annual Flow at Station #14182500 (30 years, 1991-2020)

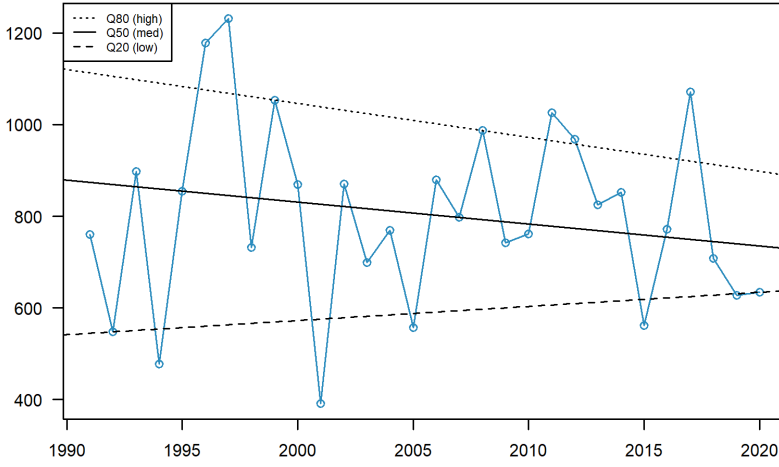


Station #14182500

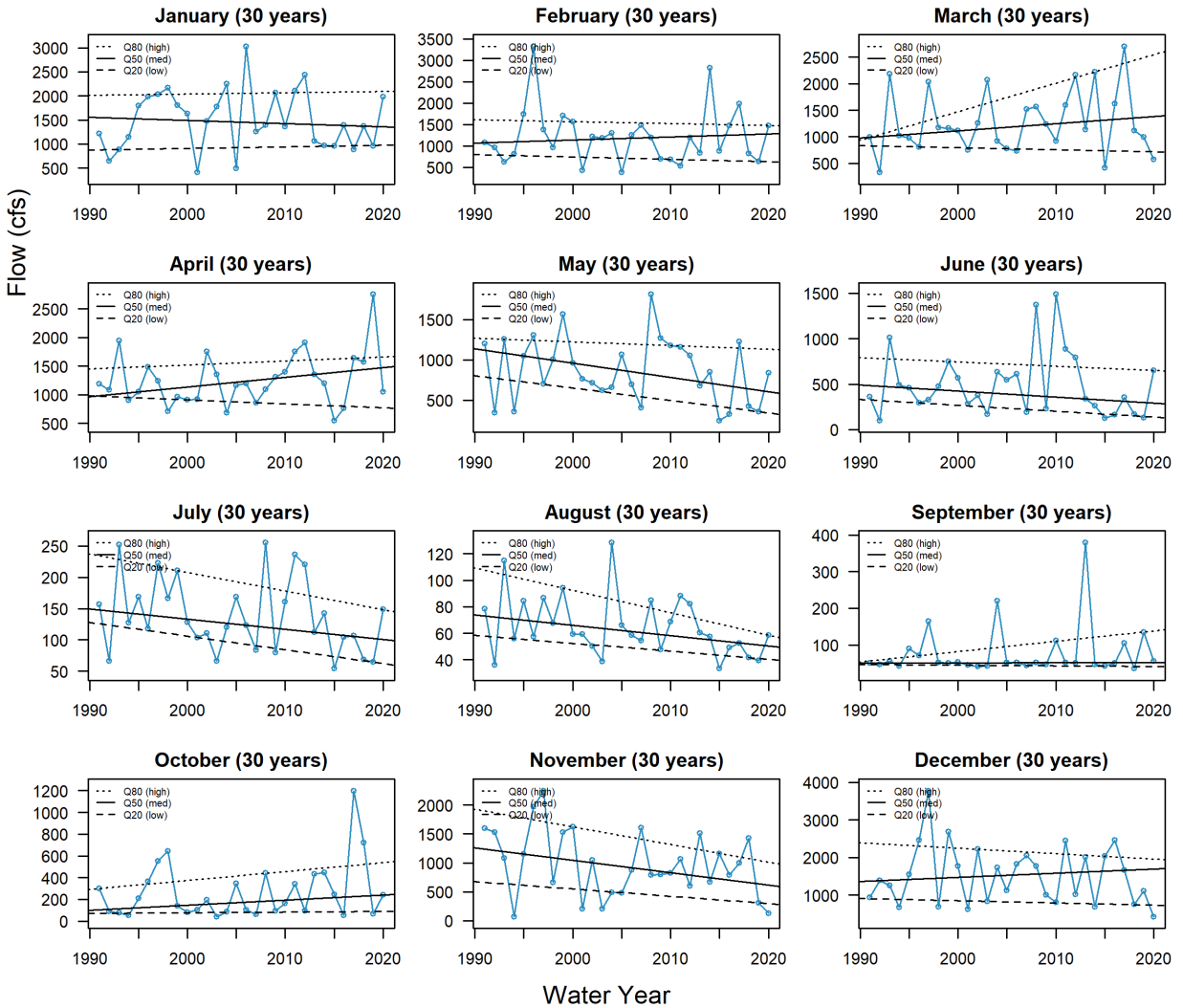
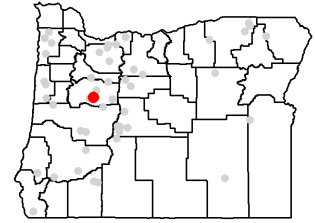


Base-period Flow Trends for Station #14185000

Annual Flow at Station #14185000 (30 years, 1991-2020)

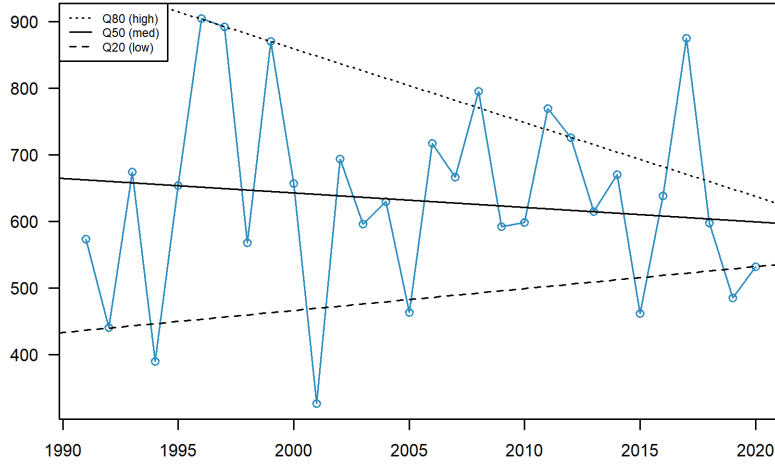


Station #14185000

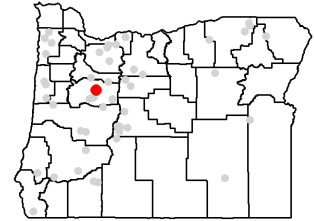


Base-period Flow Trends for Station #14185900

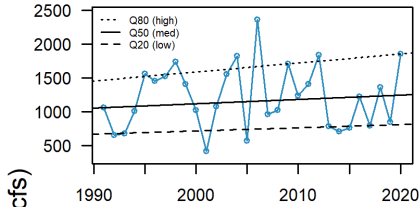
Annual Flow at Station #14185900 (30 years, 1991-2020)



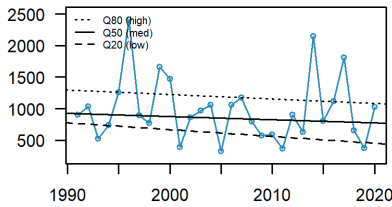
Station #14185900



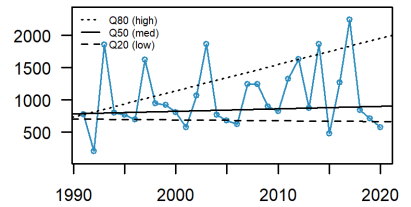
January (30 years)



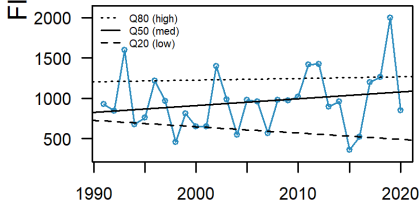
February (30 years)



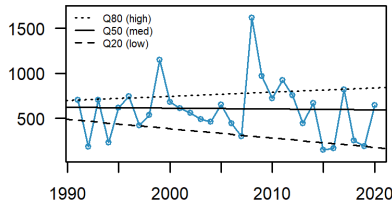
March (30 years)



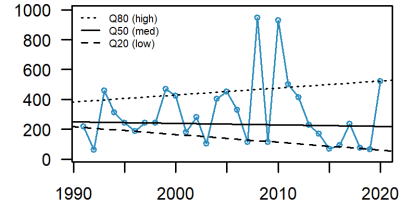
April (30 years)



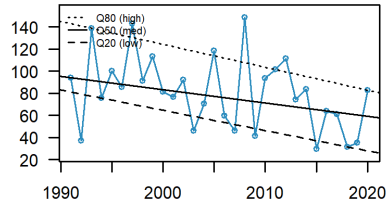
May (30 years)



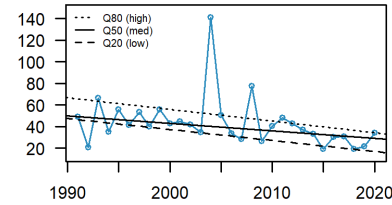
June (30 years)



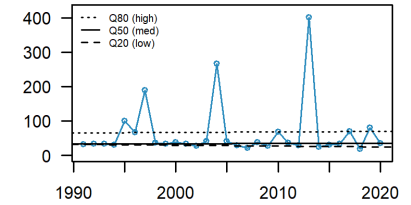
July (30 years)



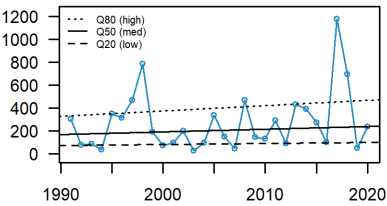
August (30 years)



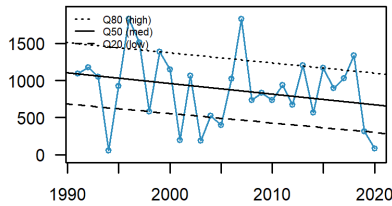
September (30 years)



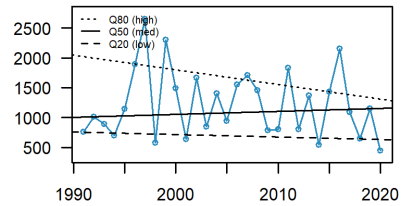
October (30 years)



November (30 years)



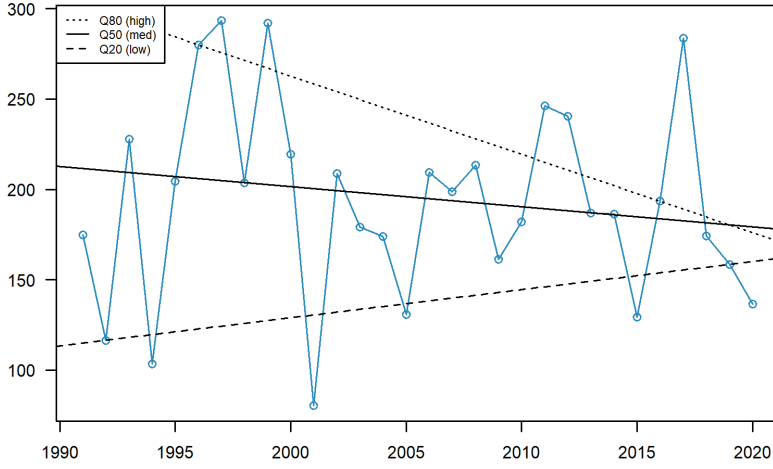
December (30 years)



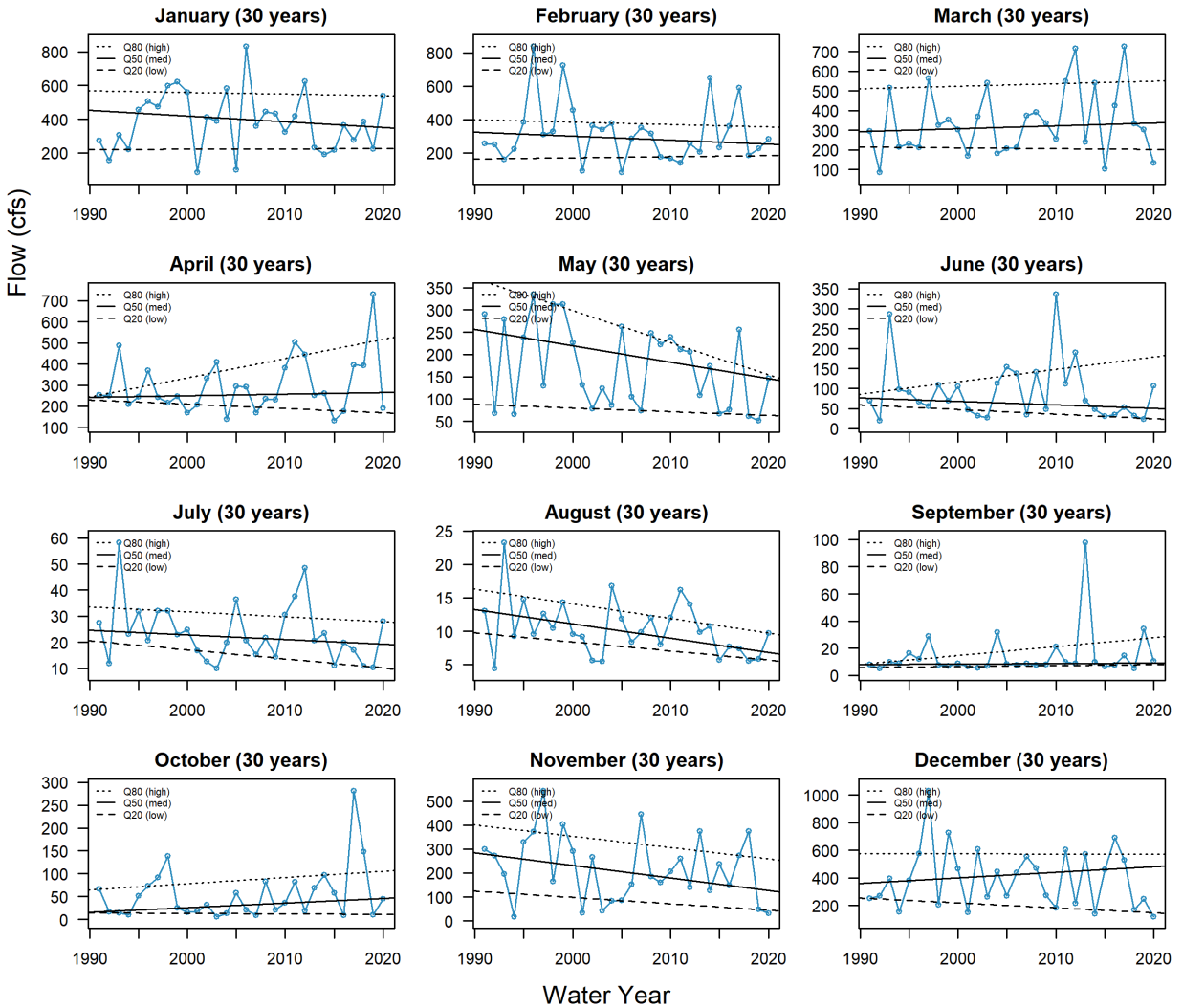
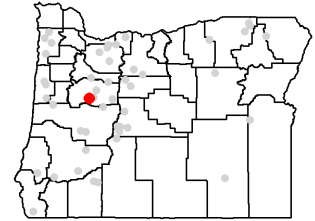
Water Year

Base-period Flow Trends for Station #14187000

Annual Flow at Station #14187000 (30 years, 1991-2020)

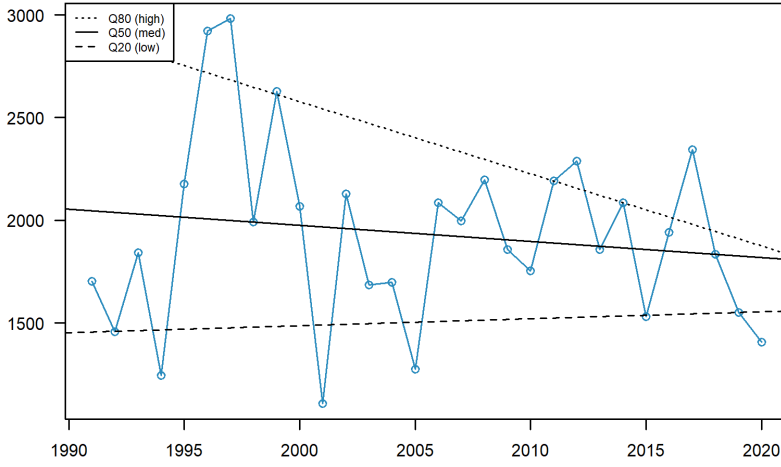


Station #14187000

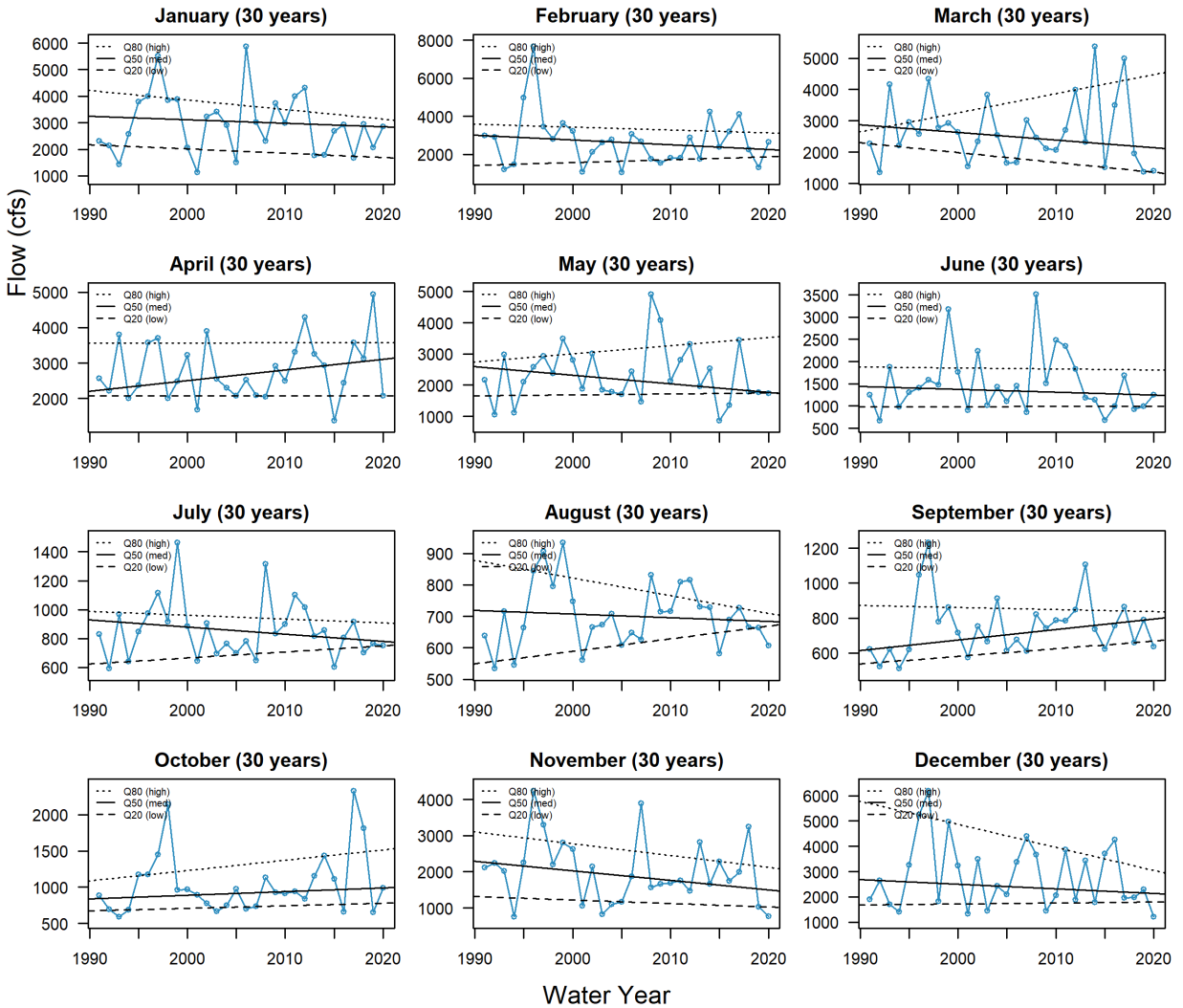
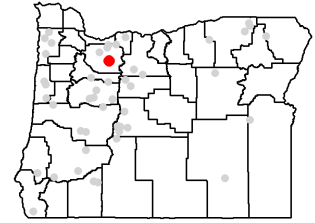


Base-period Flow Trends for Station #14209500

Annual Flow at Station #14209500 (30 years, 1991-2020)

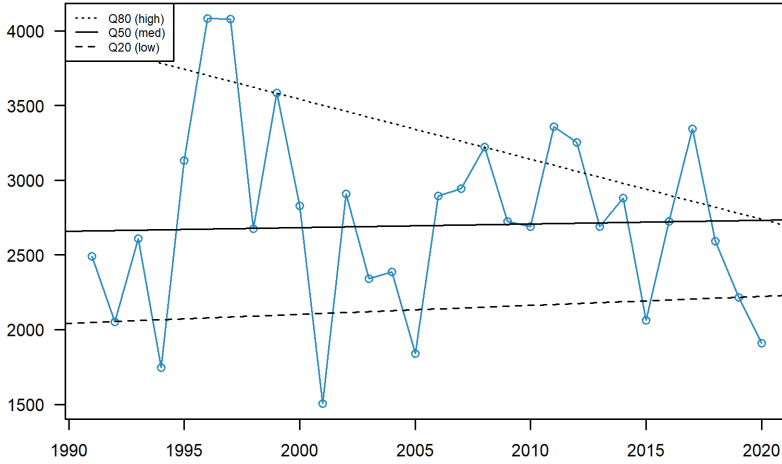


Station #14209500

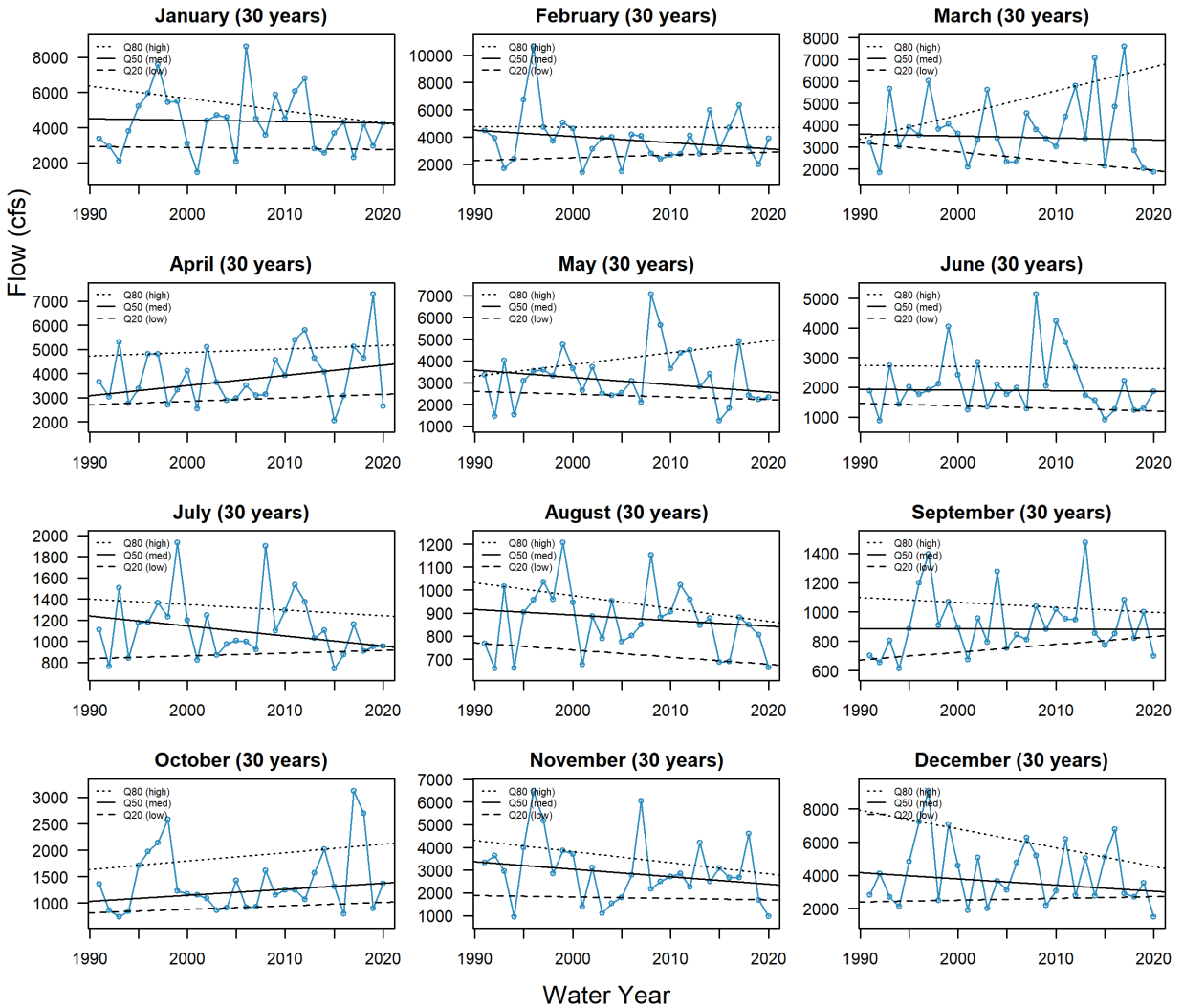
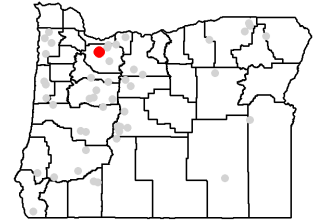


Base-period Flow Trends for Station #14210000

Annual Flow at Station #14210000 (30 years, 1991-2020)

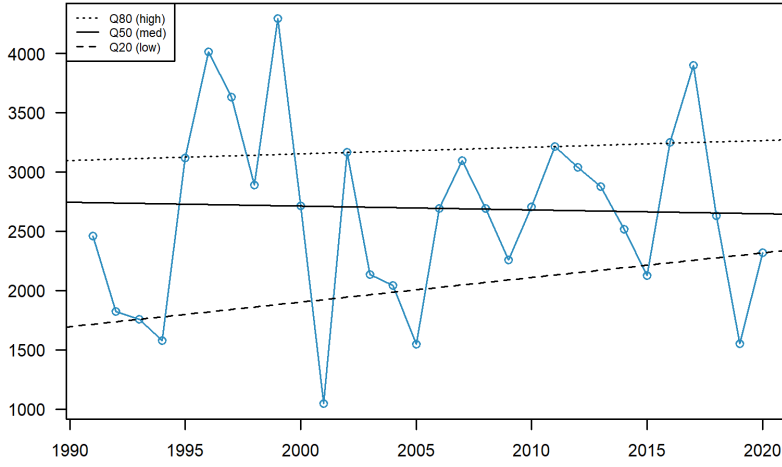


Station #14210000

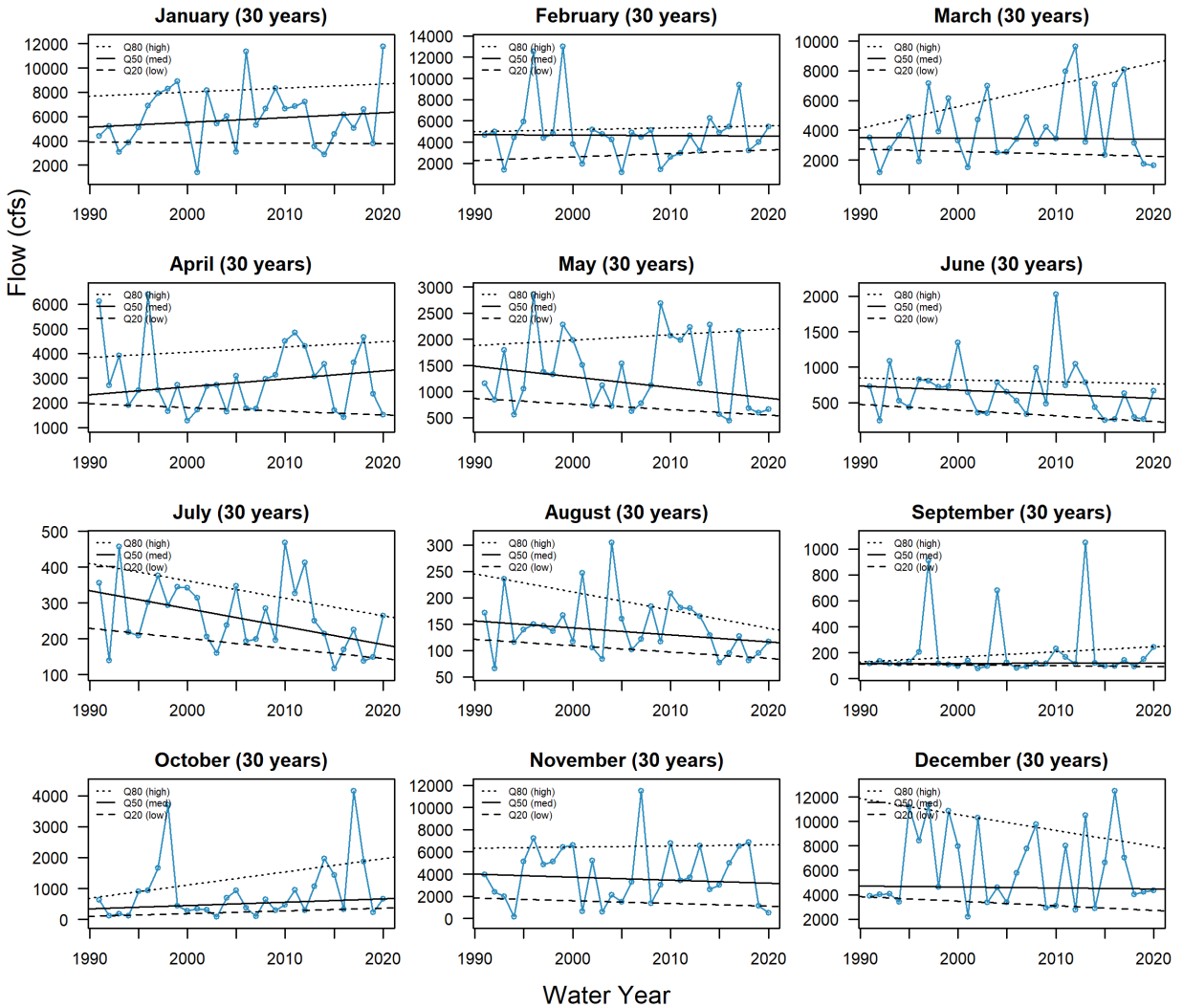
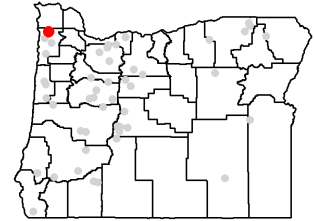


Base-period Flow Trends for Station #14301000

Annual Flow at Station #14301000 (30 years, 1991-2020)

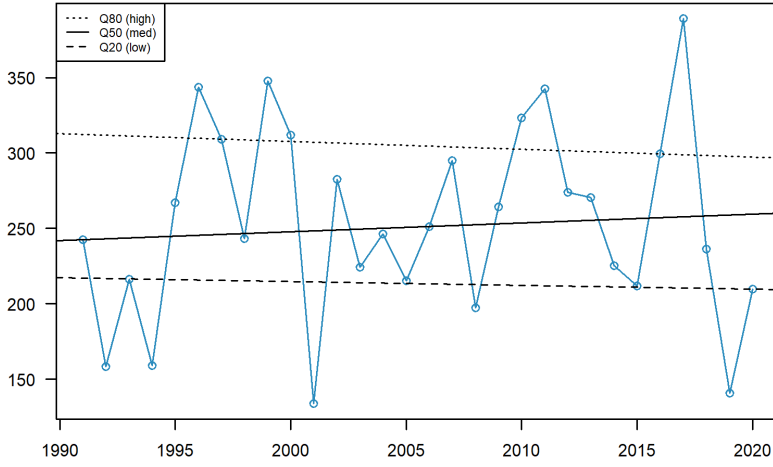


Station #14301000

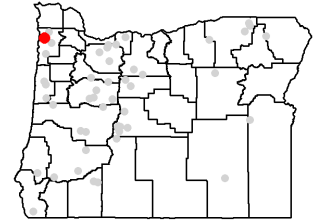


Base-period Flow Trends for Station #14301300

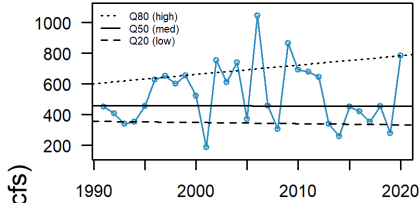
Annual Flow at Station #14301300 (30 years, 1991-2020)



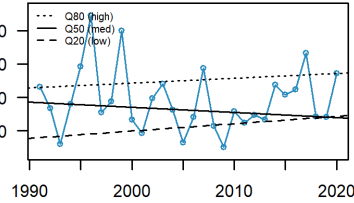
Station #14301300



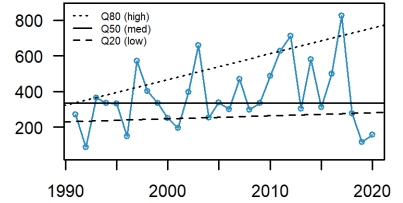
January (30 years)



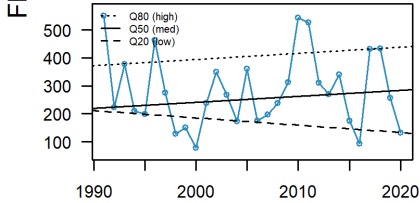
February (30 years)



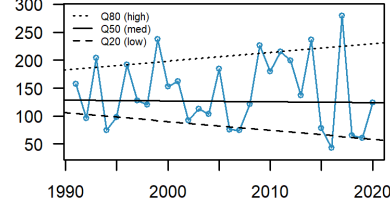
March (30 years)



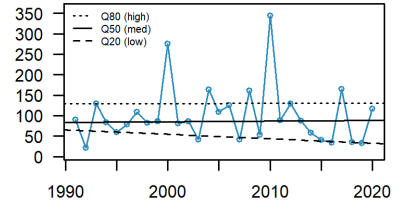
April (30 years)



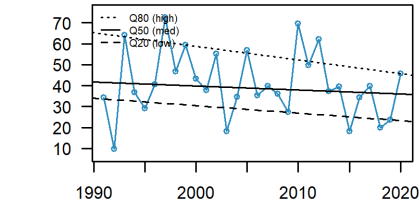
May (30 years)



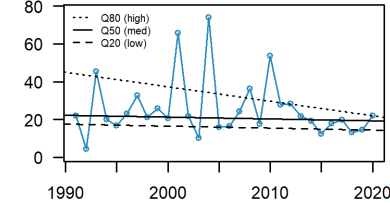
June (30 years)



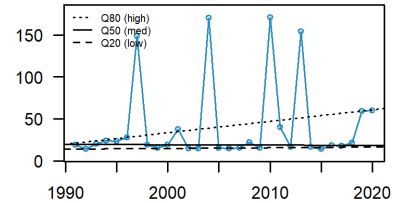
July (30 years)



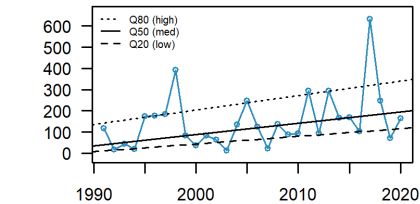
August (30 years)



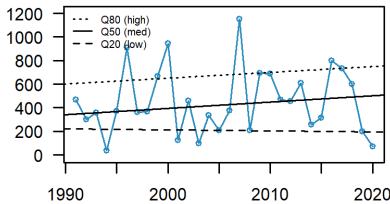
September (30 years)



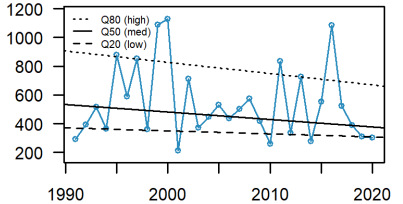
October (30 years)



November (30 years)



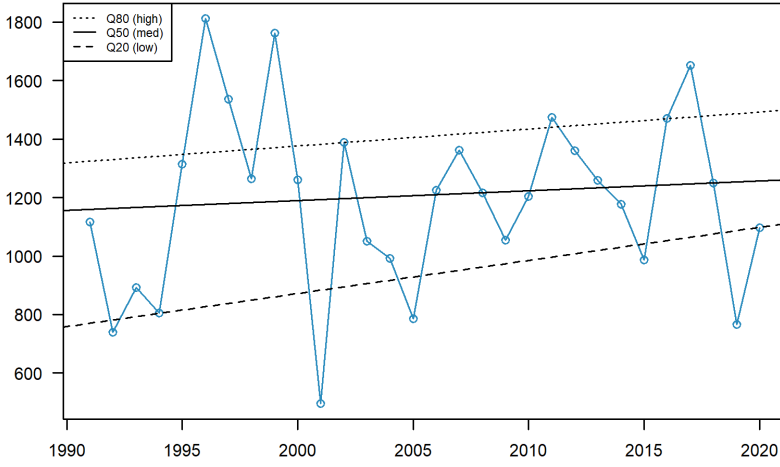
December (30 years)



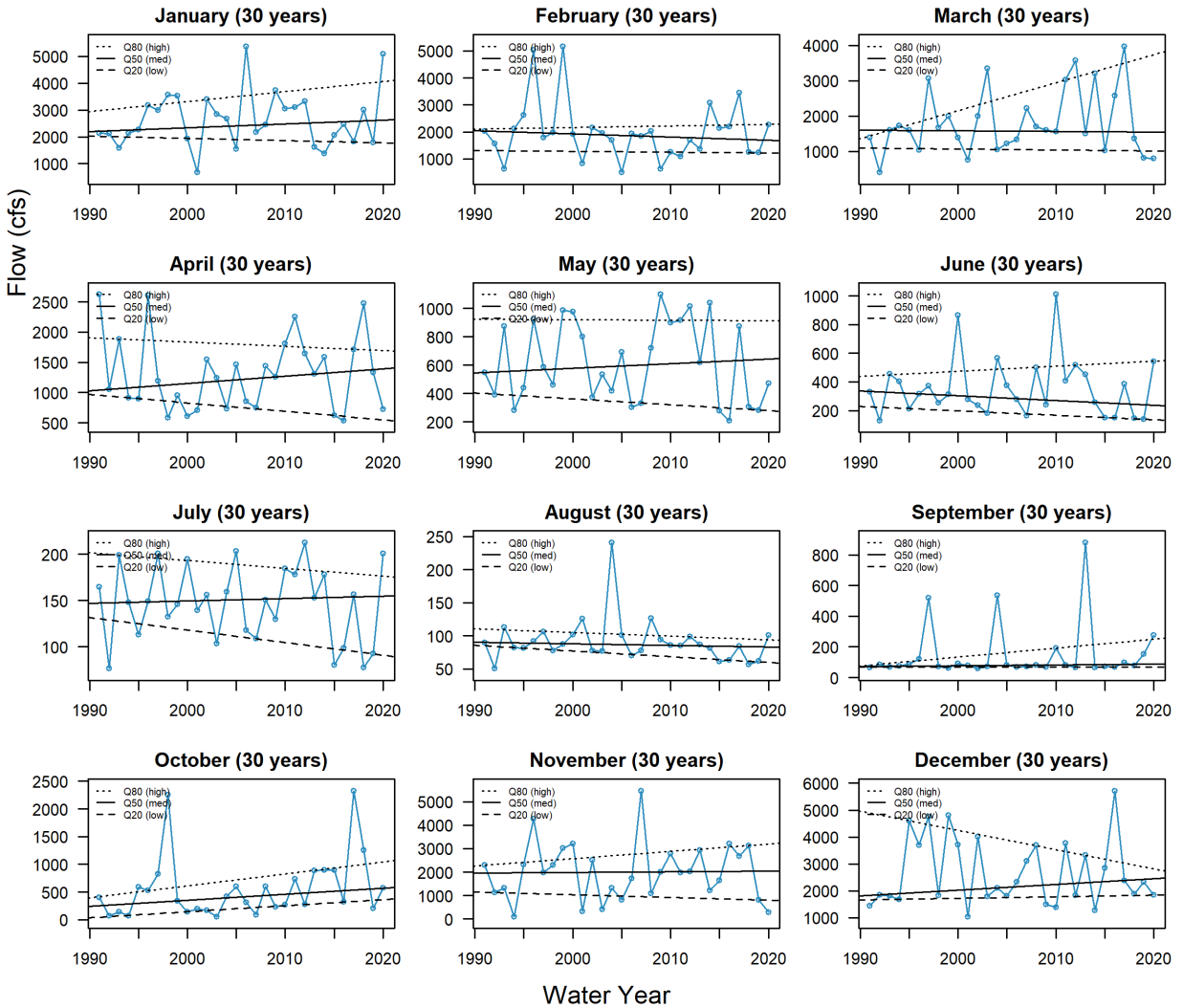
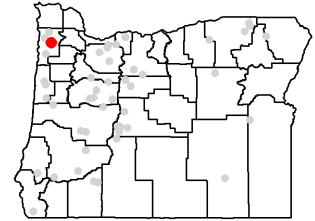
Water Year

Base-period Flow Trends for Station #14301500

Annual Flow at Station #14301500 (30 years, 1991-2020)

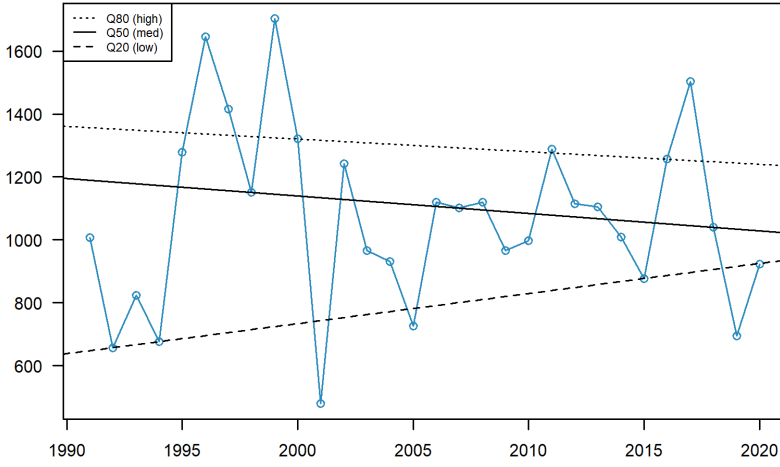


Station #14301500

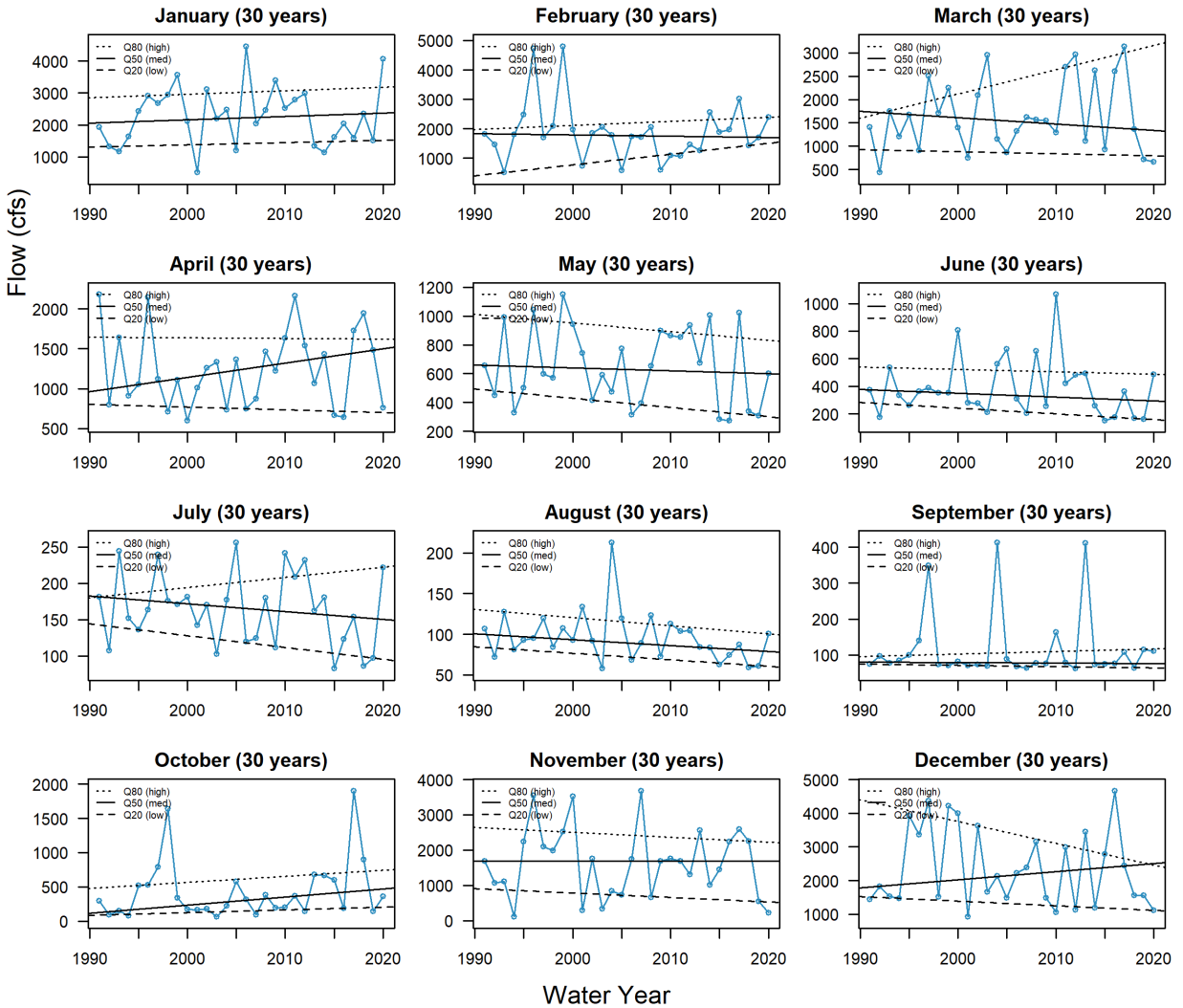
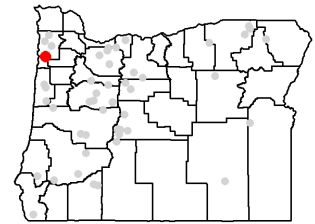


Base-period Flow Trends for Station #14303600

Annual Flow at Station #14303600 (30 years, 1991-2020)

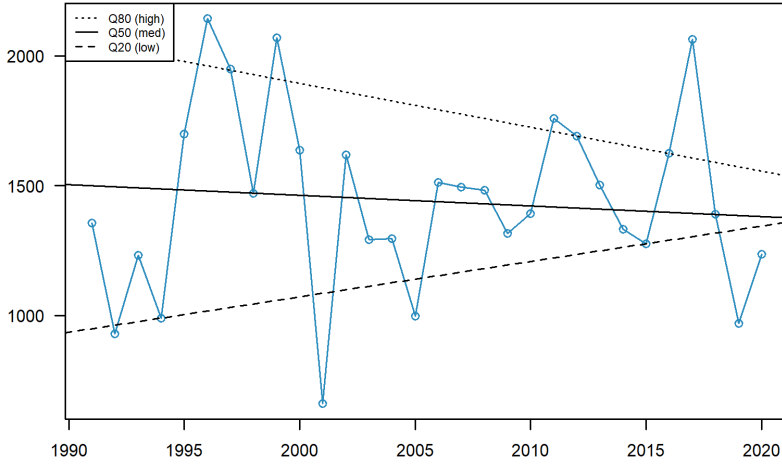


Station #14303600

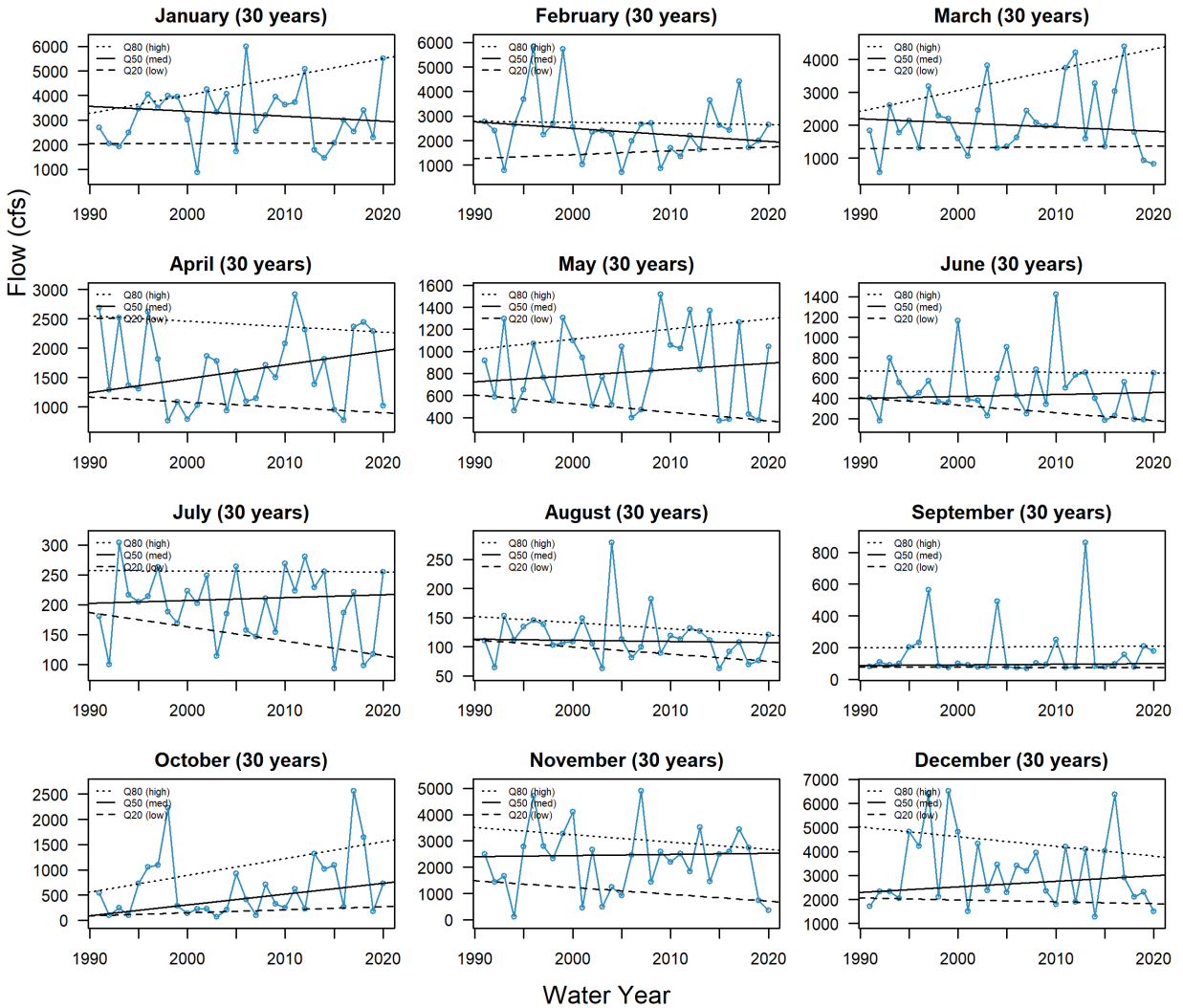
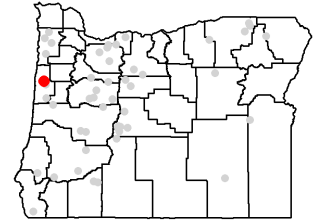


Base-period Flow Trends for Station #14305500

Annual Flow at Station #14305500 (30 years, 1991-2020)

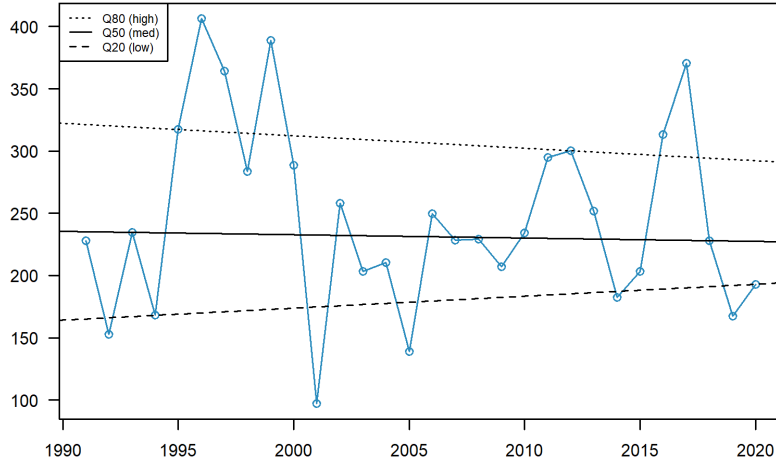


Station #14305500

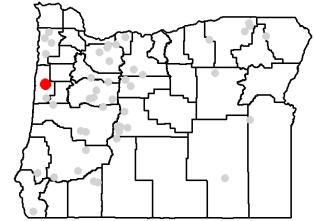


Base-period Flow Trends for Station #14306030

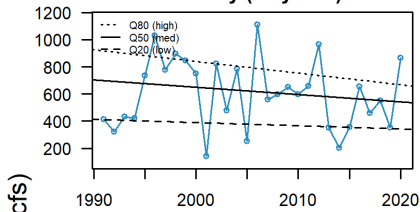
Annual Flow at Station #14306030 (30 years, 1991-2020)



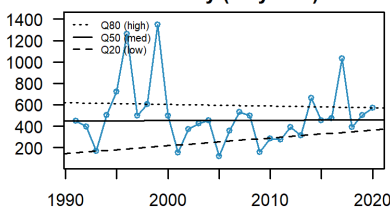
Station #14306030



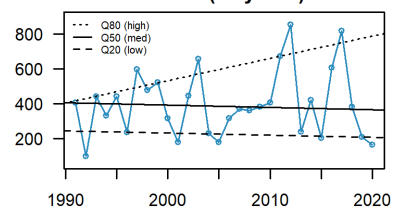
January (30 years)



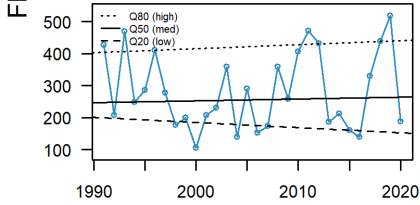
February (30 years)



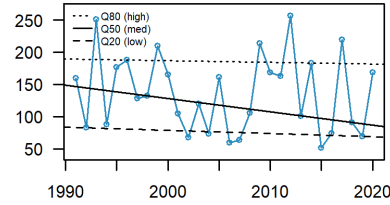
March (30 years)



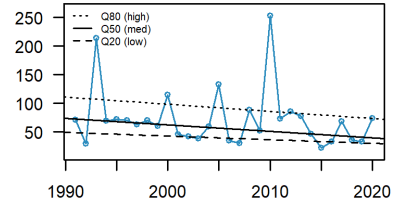
April (30 years)



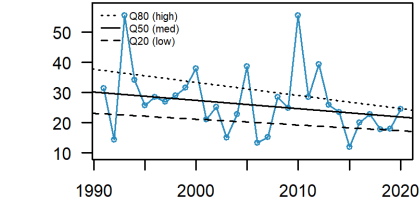
May (30 years)



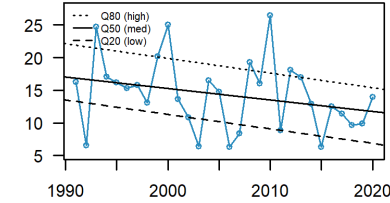
June (30 years)



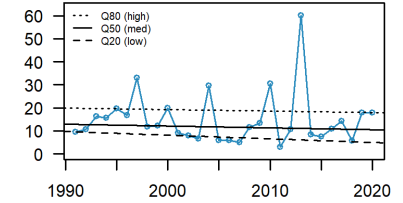
July (30 years)



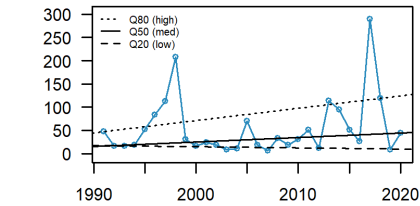
August (30 years)



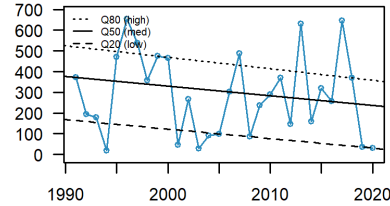
September (30 years)



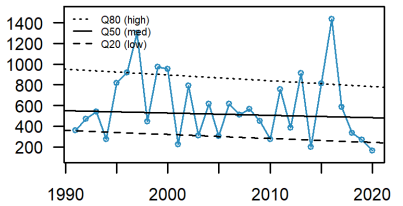
October (30 years)



November (30 years)



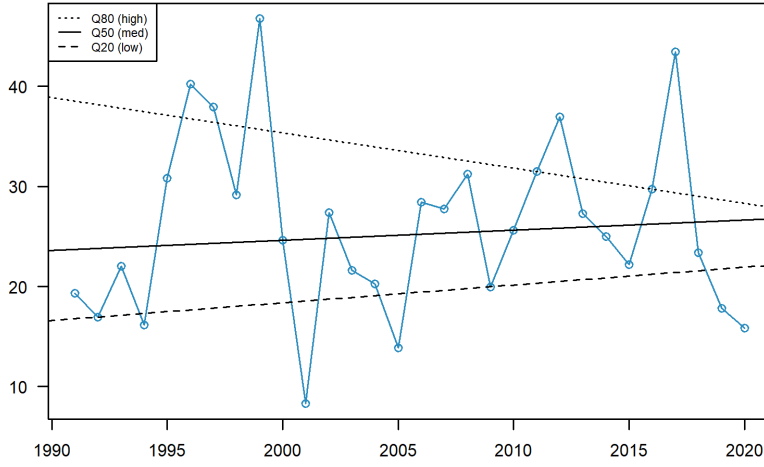
December (30 years)



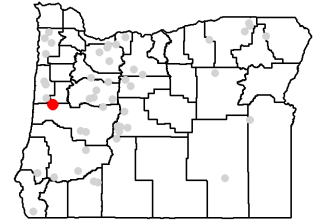
Water Year

Base-period Flow Trends for Station #14306340

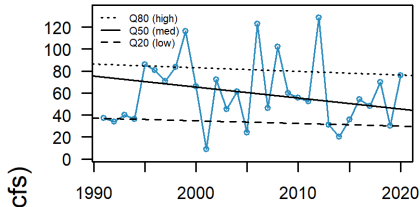
Annual Flow at Station #14306340 (30 years, 1991-2020)



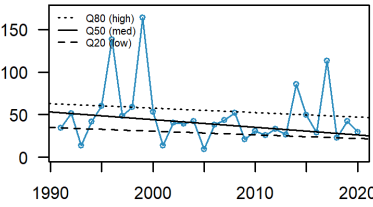
Station #14306340



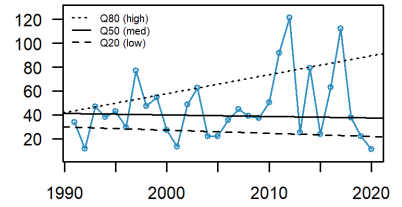
January (30 years)



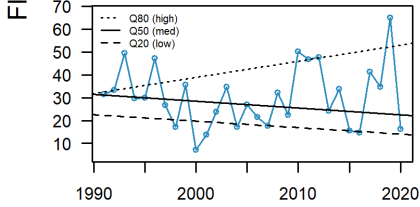
February (30 years)



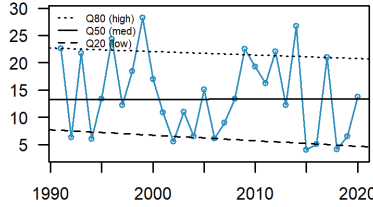
March (30 years)



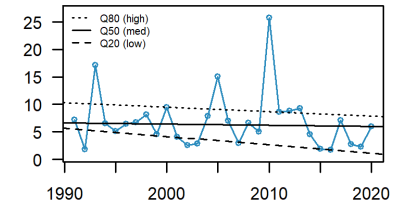
April (30 years)



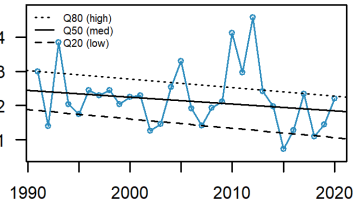
May (30 years)



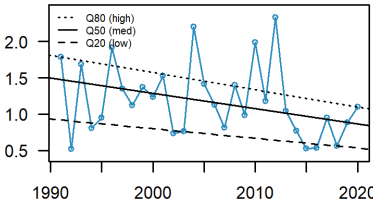
June (30 years)



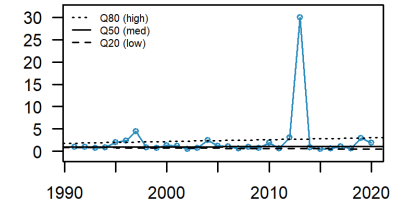
July (30 years)



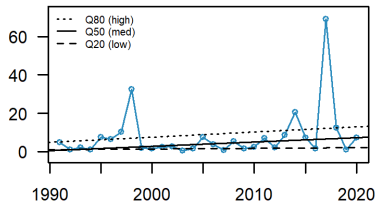
August (30 years)



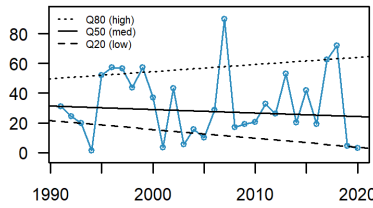
September (30 years)



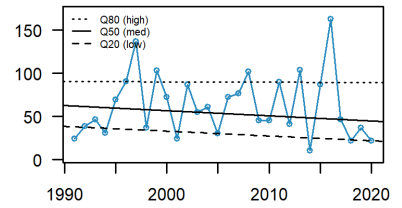
October (30 years)



November (30 years)



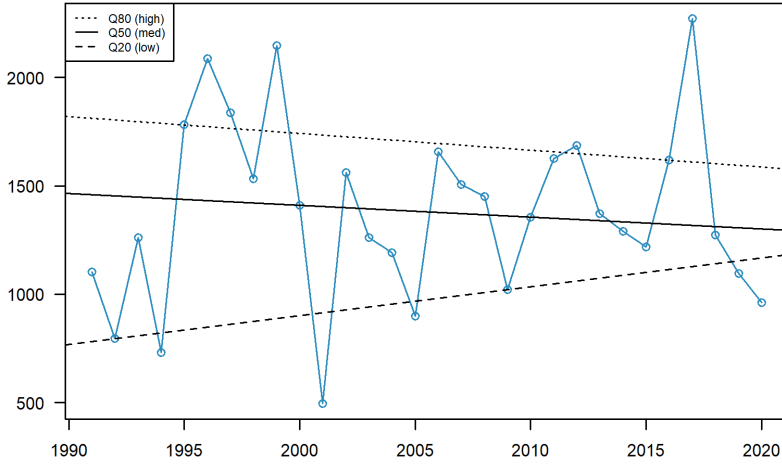
December (30 years)



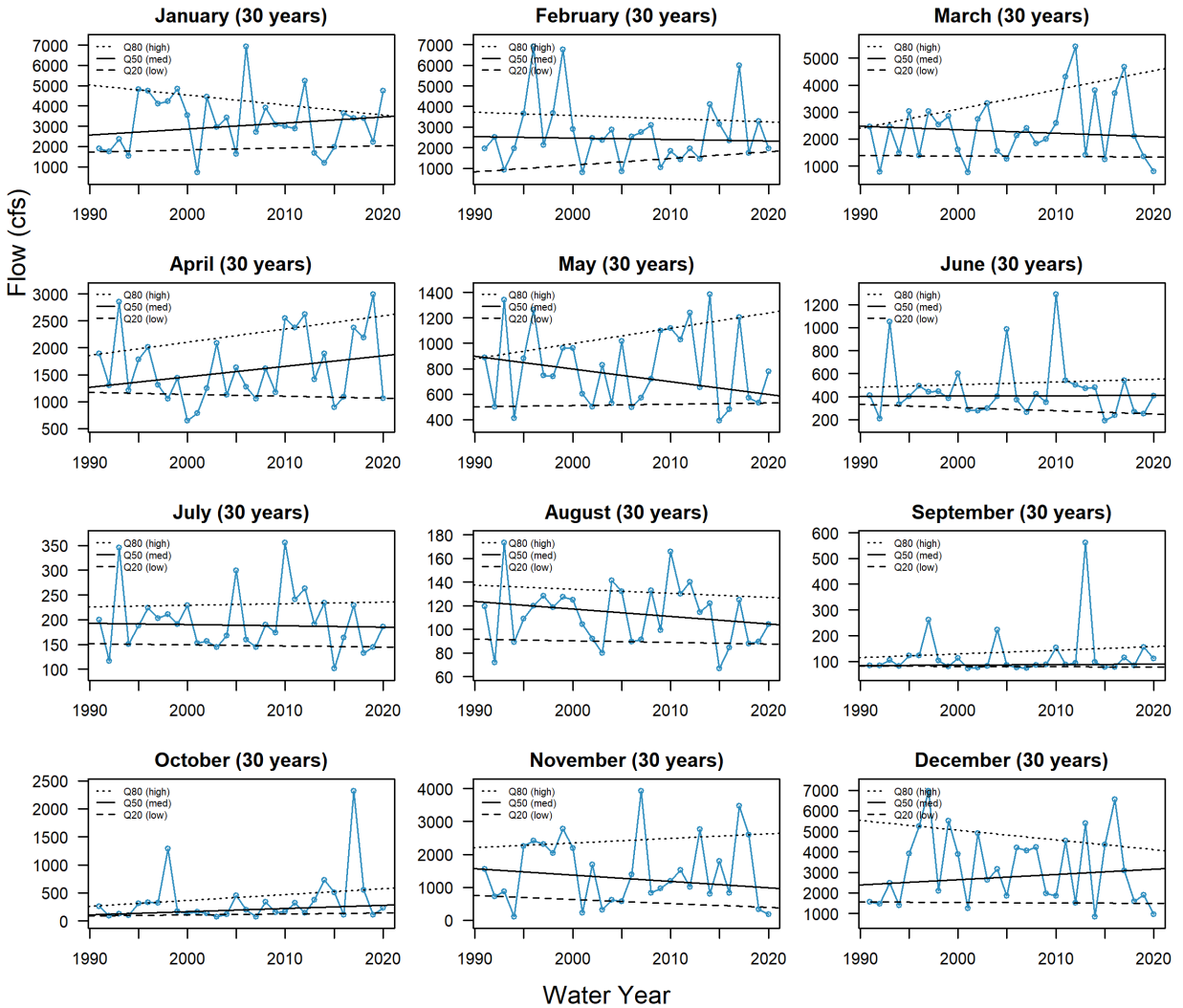
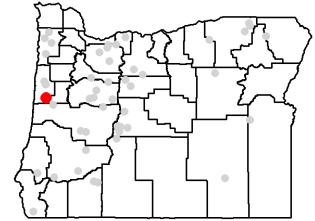
Water Year

Base-period Flow Trends for Station #14306500

Annual Flow at Station #14306500 (30 years, 1991-2020)

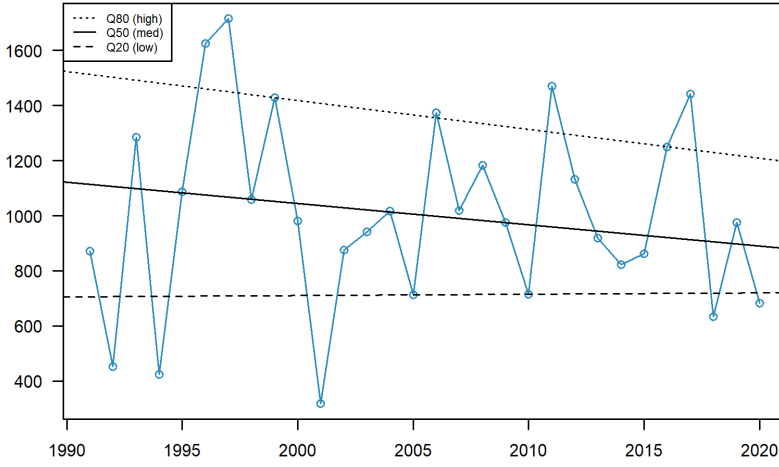


Station #14306500

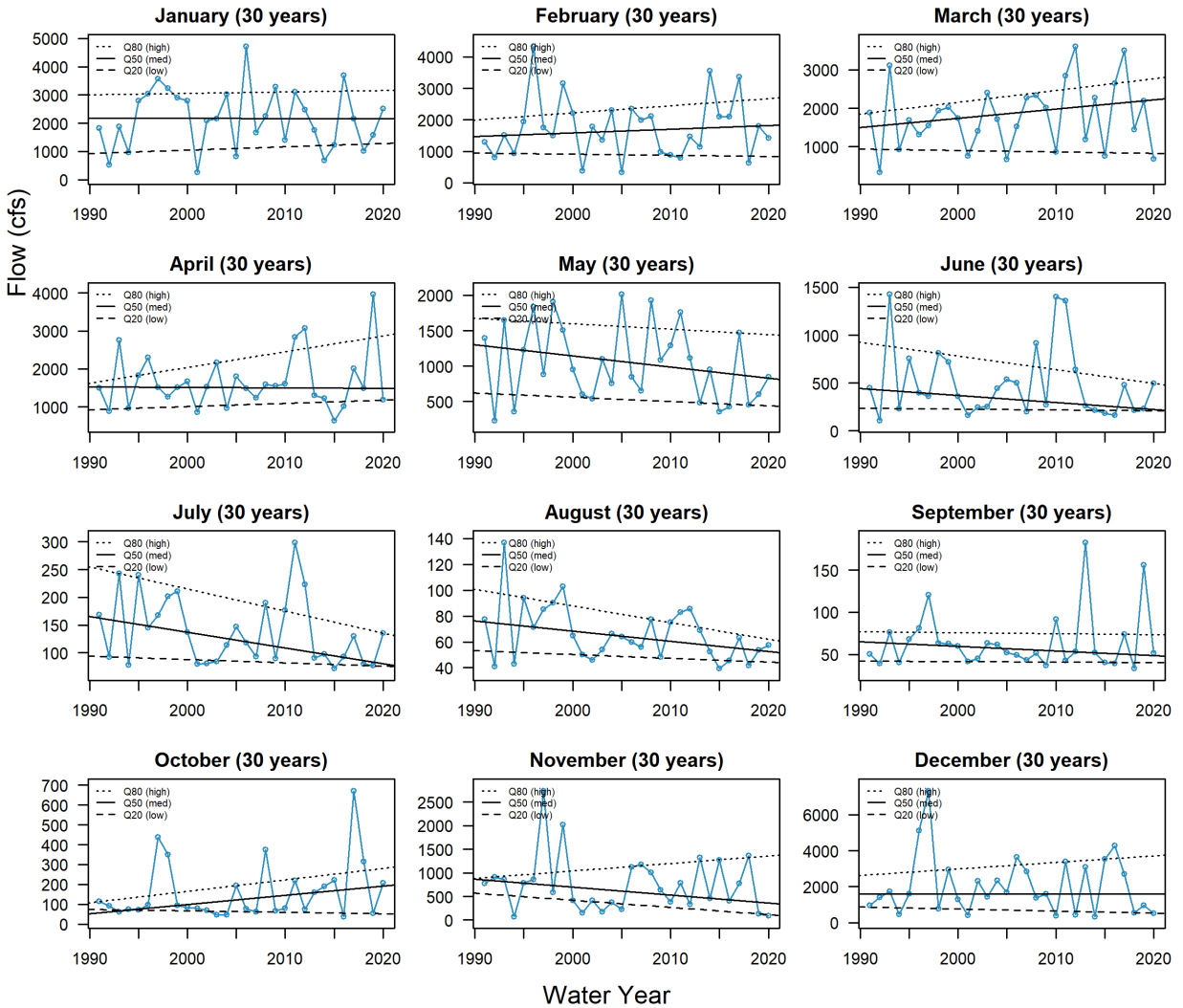
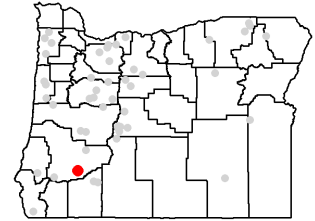


Base-period Flow Trends for Station #14308000

Annual Flow at Station #14308000 (30 years, 1991-2020)

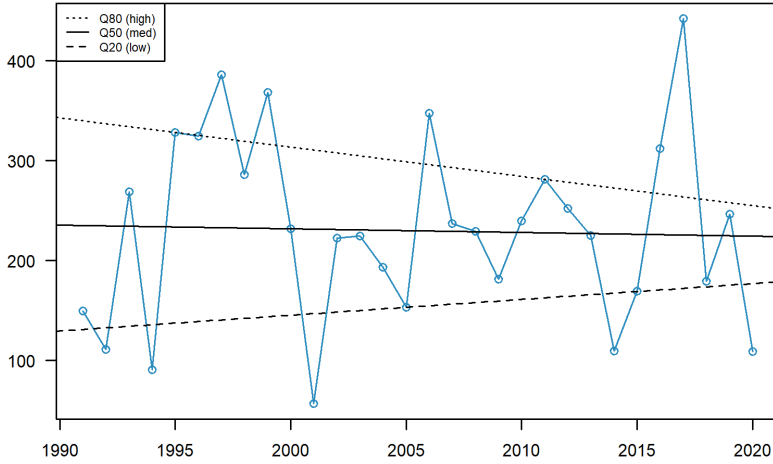


Station #14308000

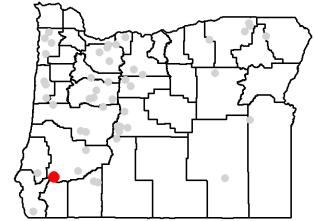


Base-period Flow Trends for Station #14309500

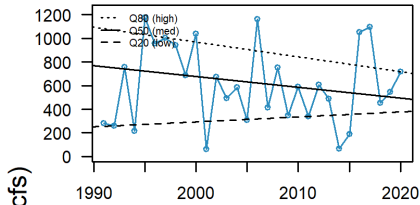
Annual Flow at Station #14309500 (30 years, 1991-2020)



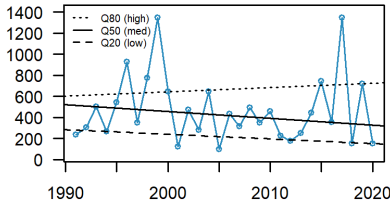
Station #14309500



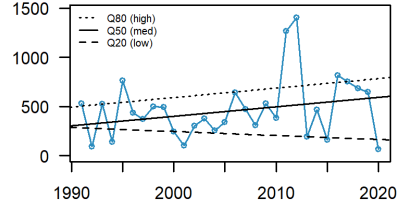
January (30 years)



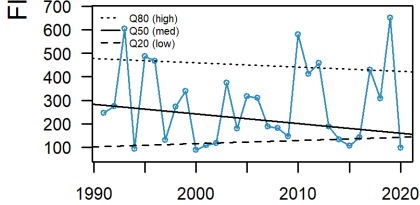
February (30 years)



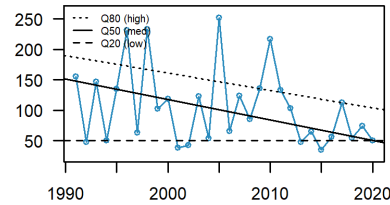
March (30 years)



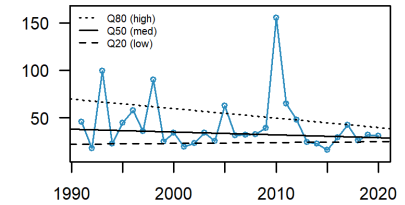
April (30 years)



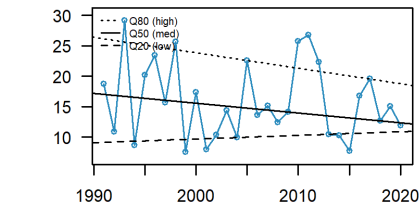
May (30 years)



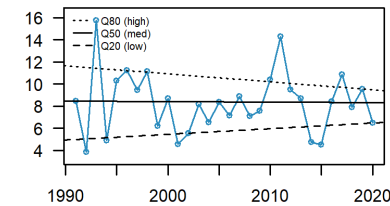
June (30 years)



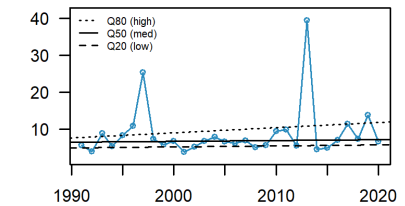
July (30 years)



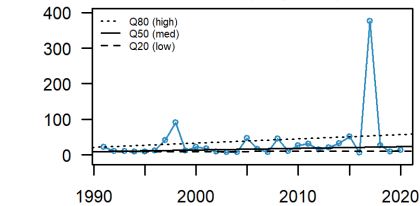
August (30 years)



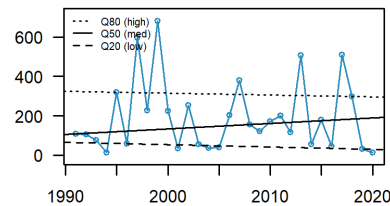
September (30 years)



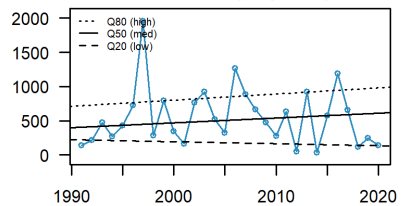
October (30 years)



November (30 years)



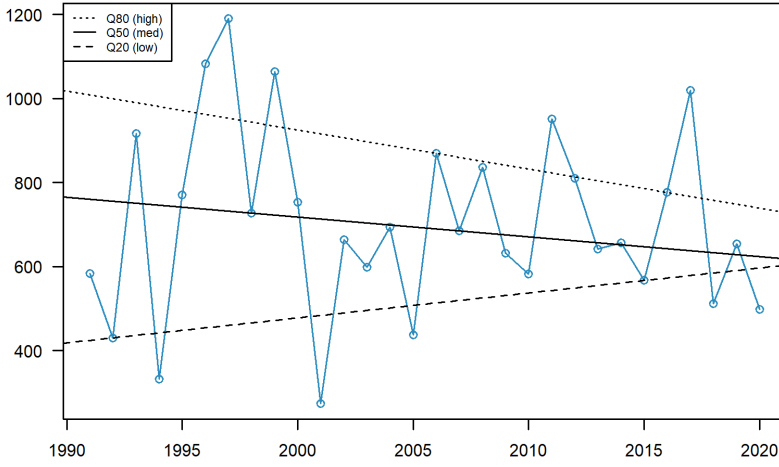
December (30 years)



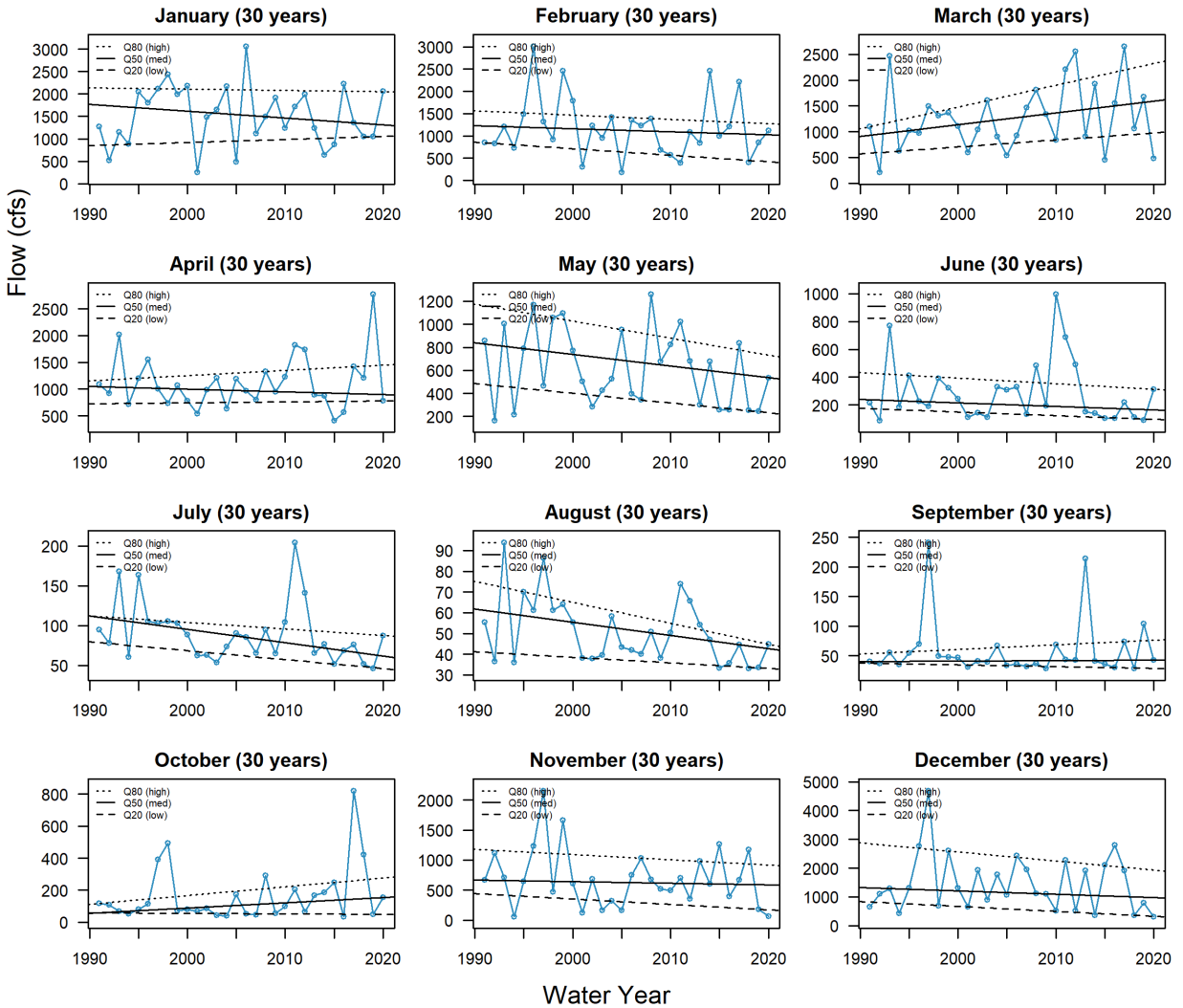
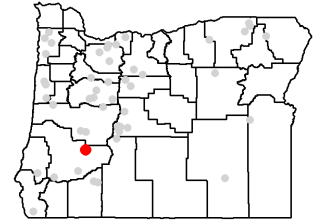
Water Year

Base-period Flow Trends for Station #14316700

Annual Flow at Station #14316700 (30 years, 1991-2020)

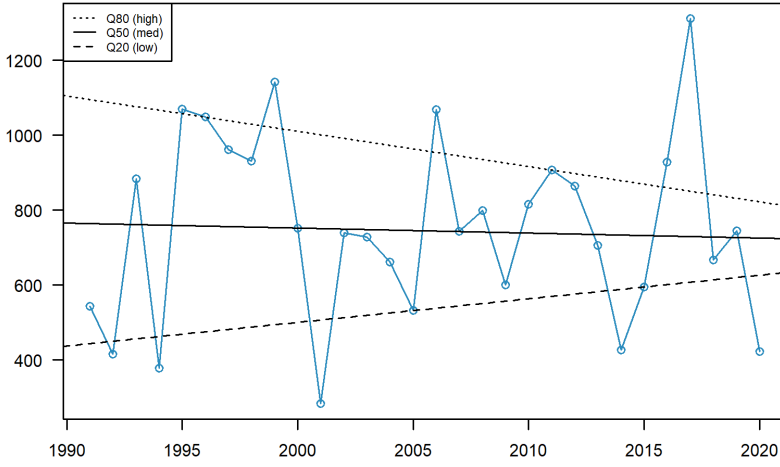


Station #14316700

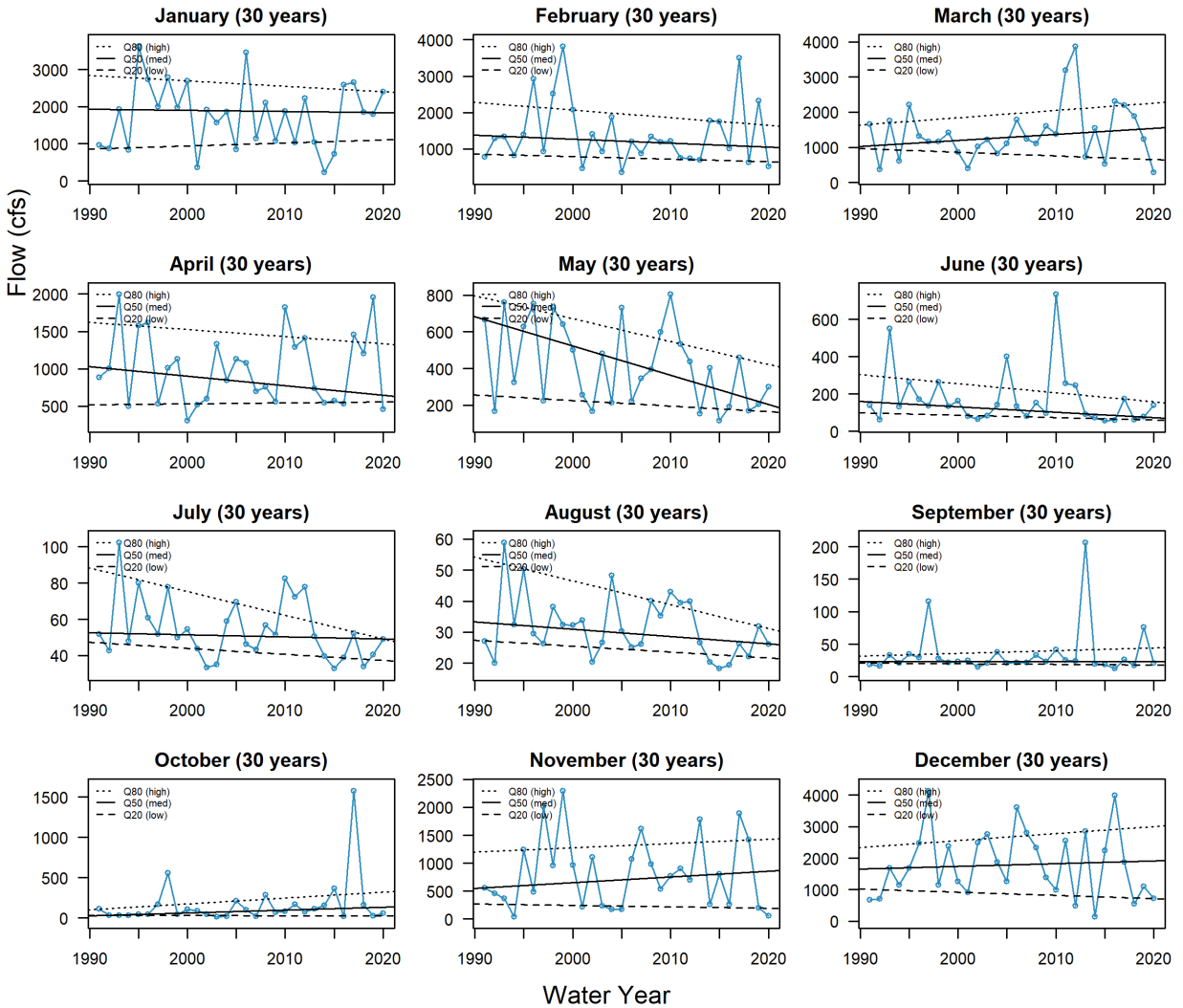
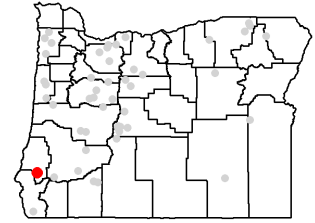


Base-period Flow Trends for Station #14325000

Annual Flow at Station #14325000 (30 years, 1991-2020)

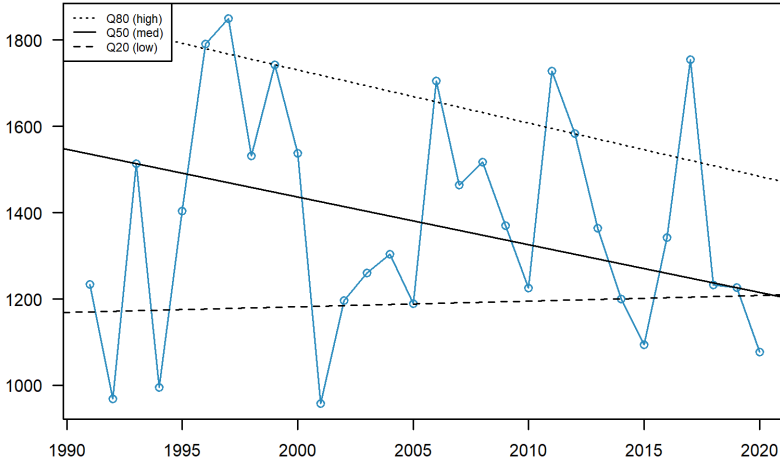


Station #14325000

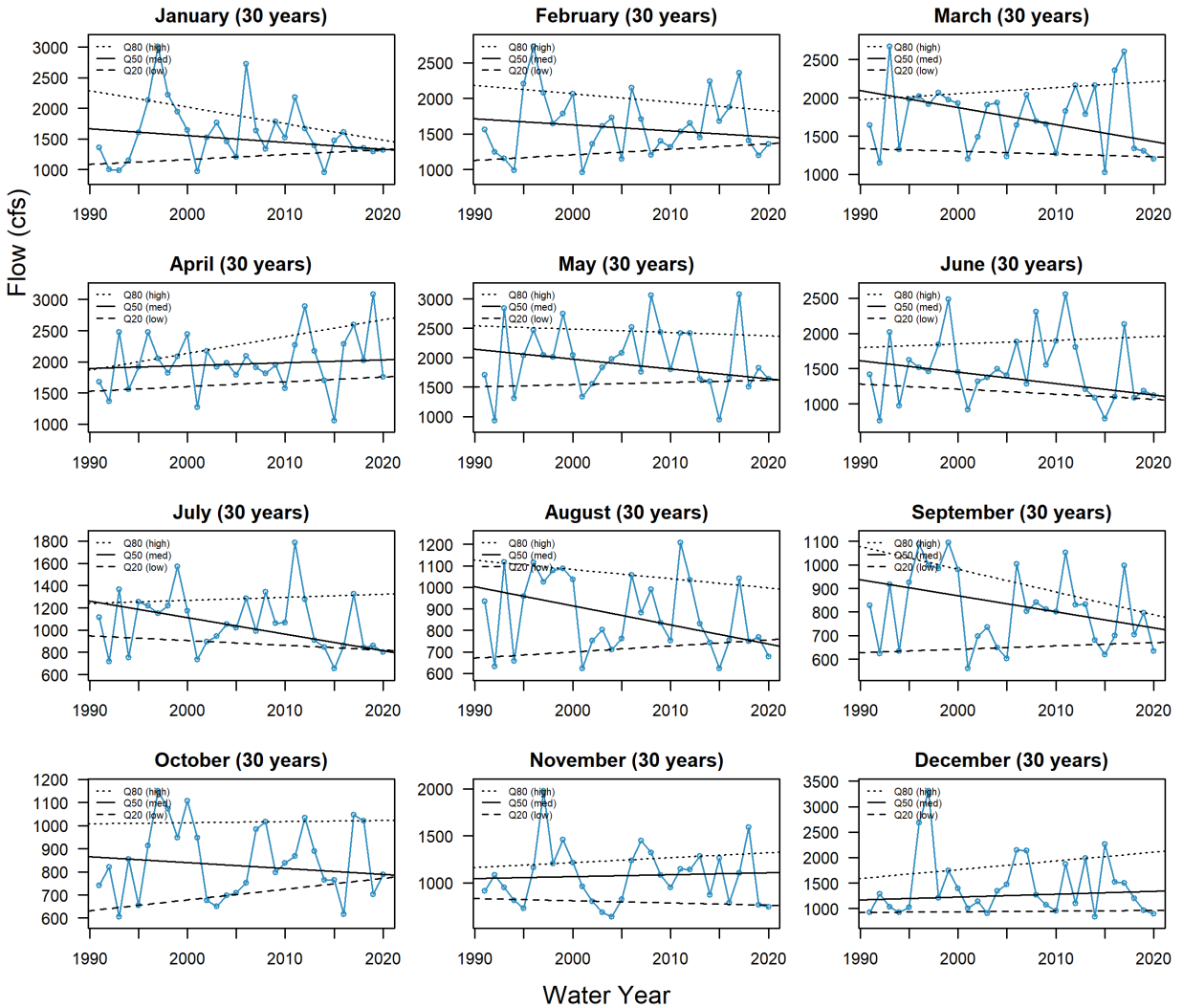
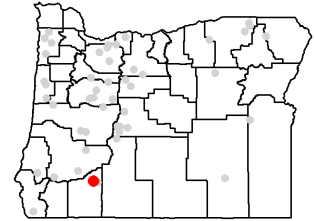


Base-period Flow Trends for Station #14330000

Annual Flow at Station #14330000 (30 years, 1991-2020)

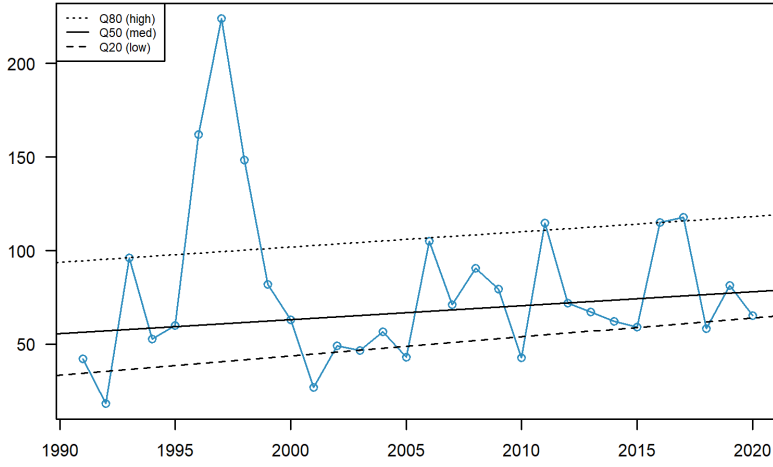


Station #14330000

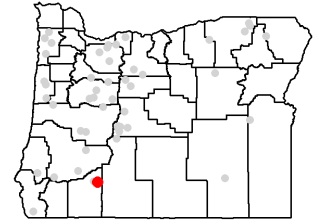


Base-period Flow Trends for Station #14332000

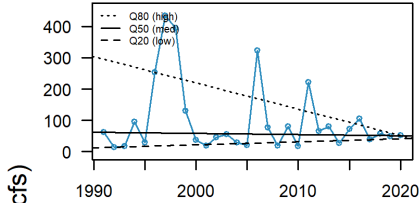
Annual Flow at Station #14332000 (30 years, 1991-2020)



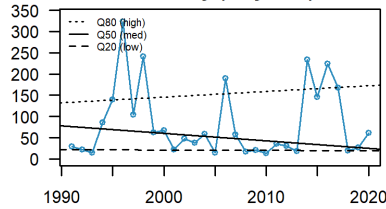
Station #14332000



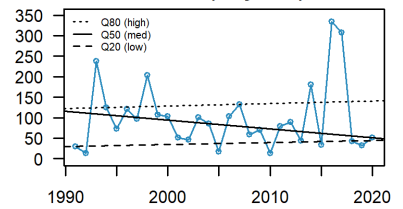
January (30 years)



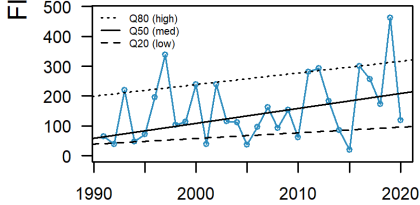
February (30 years)



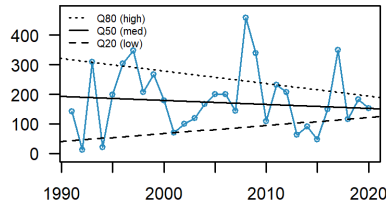
March (30 years)



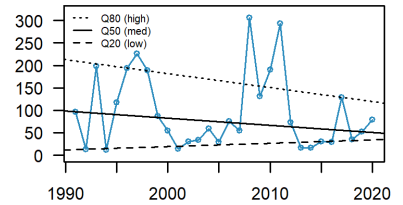
April (30 years)



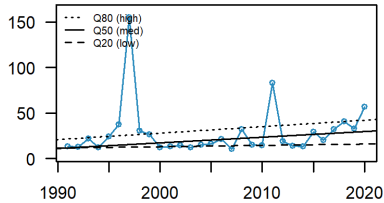
May (30 years)



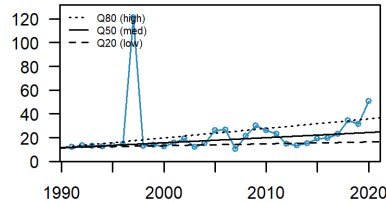
June (30 years)



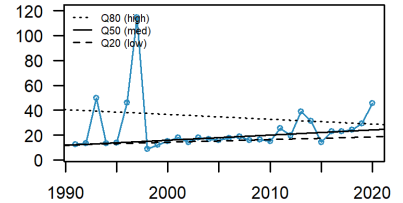
July (30 years)



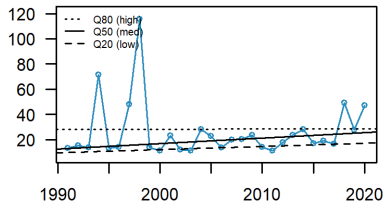
August (30 years)



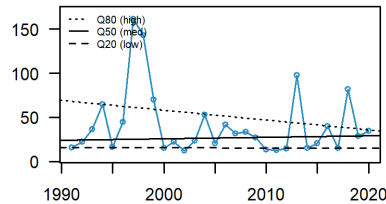
September (30 years)



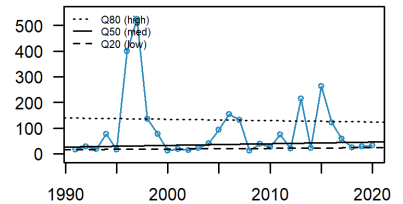
October (30 years)



November (30 years)



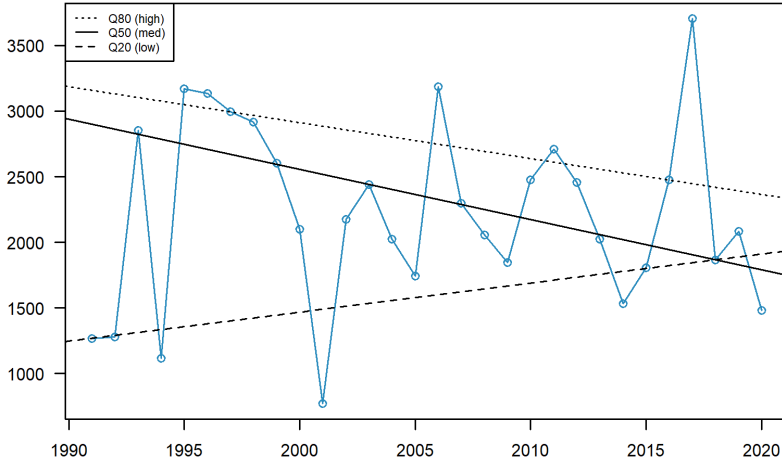
December (30 years)



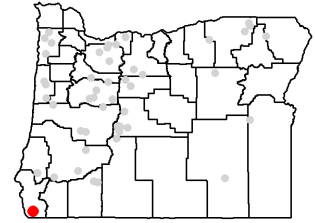
Water Year

Base-period Flow Trends for Station #14400000

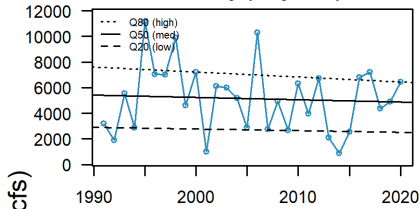
Annual Flow at Station #14400000 (30 years, 1991-2020)



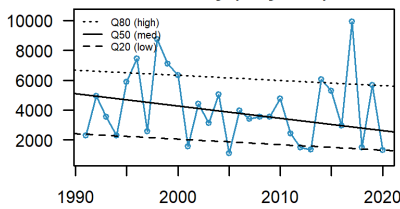
Station #14400000



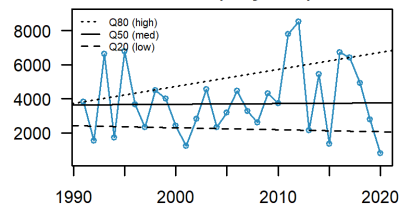
January (30 years)



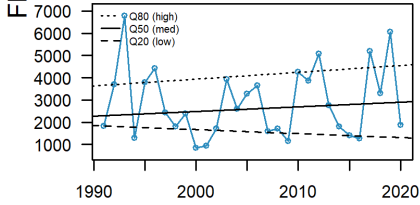
February (30 years)



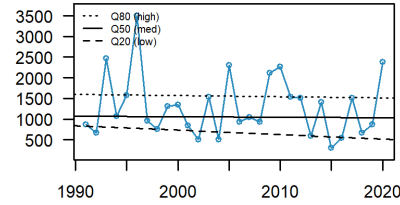
March (30 years)



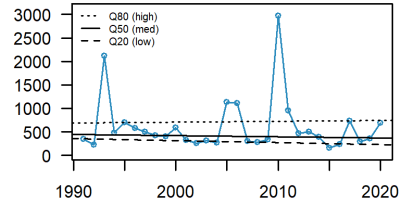
April (30 years)



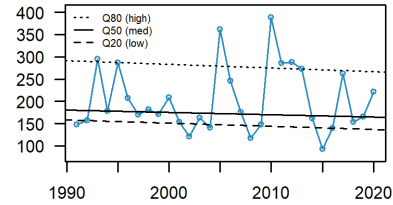
May (30 years)



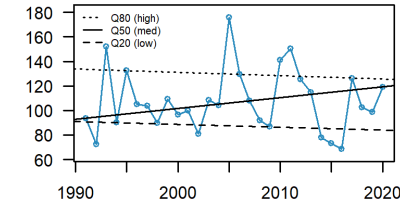
June (30 years)



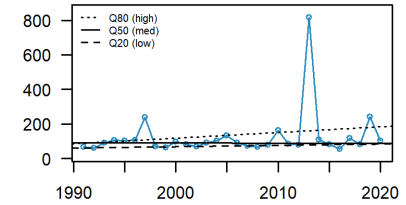
July (30 years)



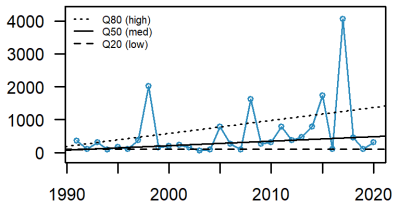
August (30 years)



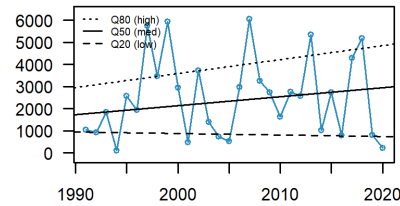
September (30 years)



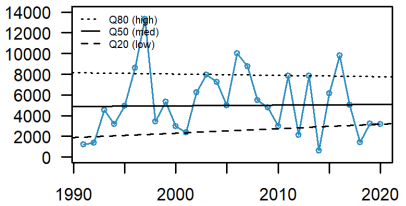
October (30 years)



November (30 years)



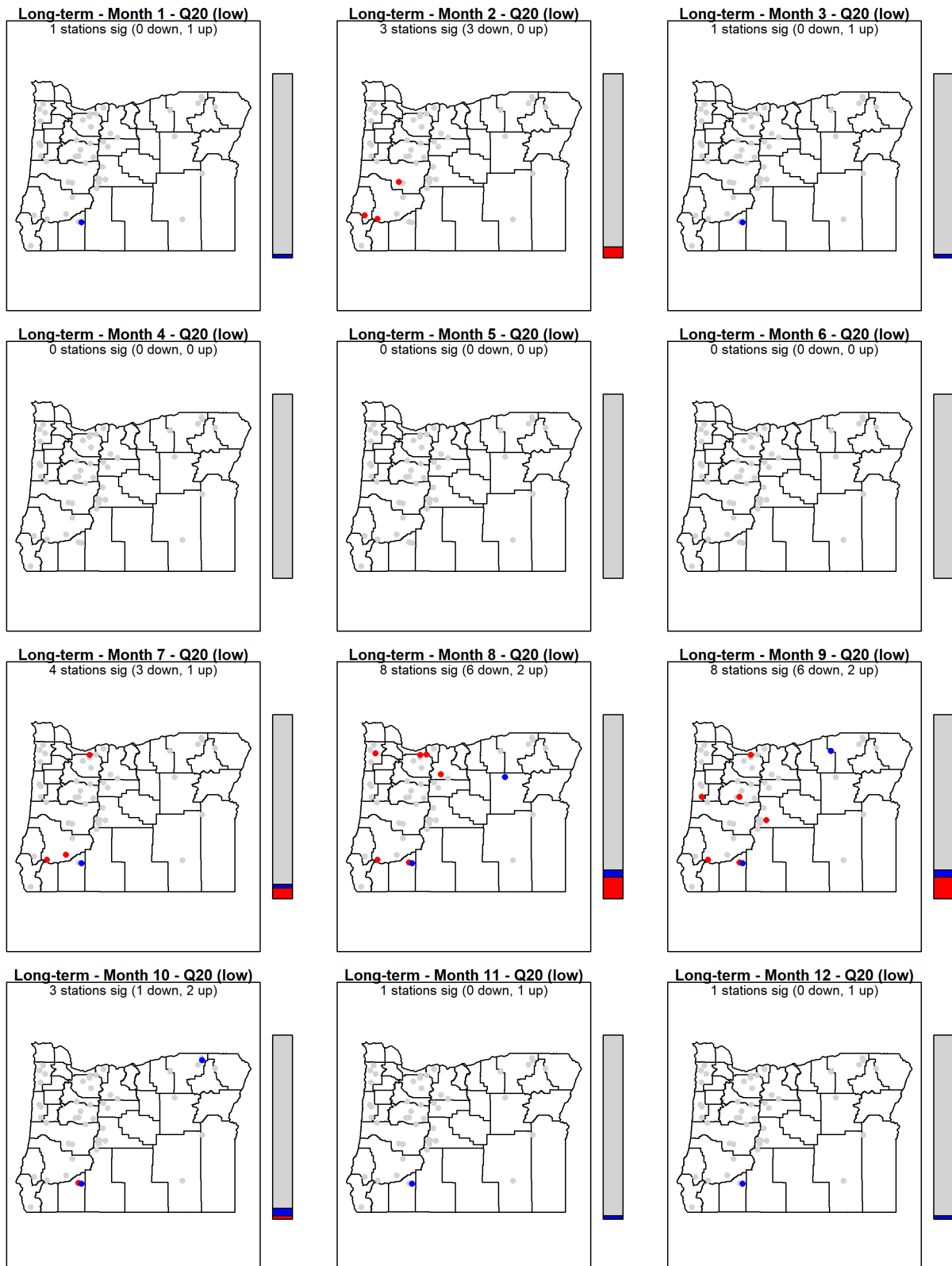
December (30 years)



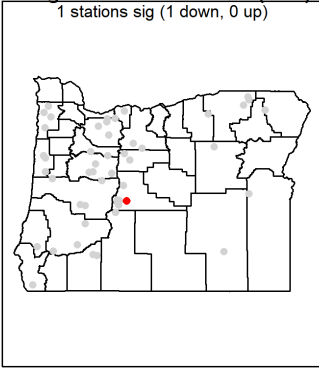
Water Year

# Appendix F: Additional Maps – Quantile Regression and Autocorrelation – Long-term Period

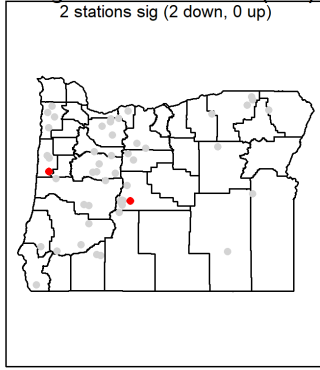
Monthly maps of trend significance of quantile regression of mean monthly flow at 51 stations. Red (blue) indicates significant downward (upward) trend. Record assessed ranges from 35 to 115 years.



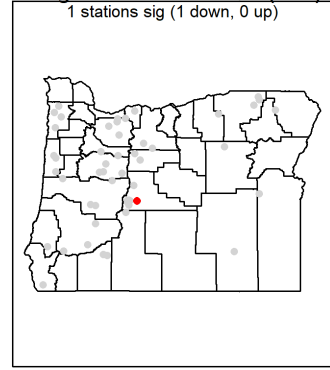
**Long-term - Month 1 - Q50 (med)**  
1 stations sig (1 down, 0 up)



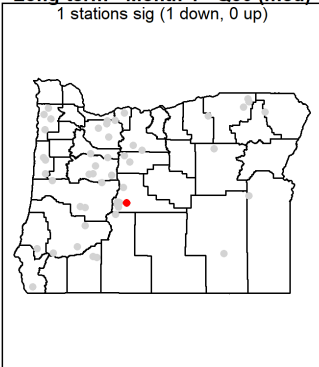
**Long-term - Month 2 - Q50 (med)**  
2 stations sig (2 down, 0 up)



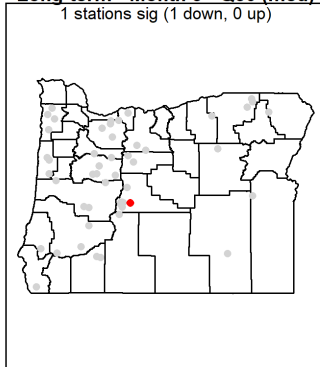
**Long-term - Month 3 - Q50 (med)**  
1 stations sig (1 down, 0 up)



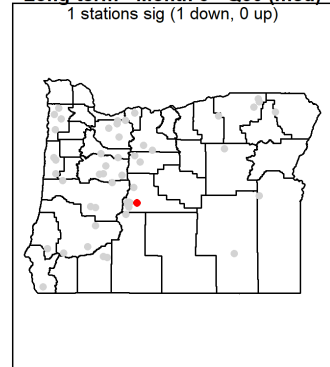
**Long-term - Month 4 - Q50 (med)**  
1 stations sig (1 down, 0 up)



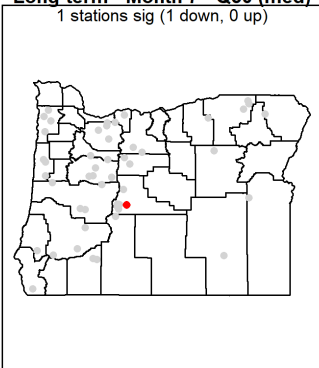
**Long-term - Month 5 - Q50 (med)**  
1 stations sig (1 down, 0 up)



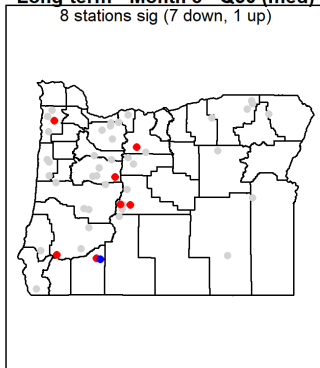
**Long-term - Month 6 - Q50 (med)**  
1 stations sig (1 down, 0 up)



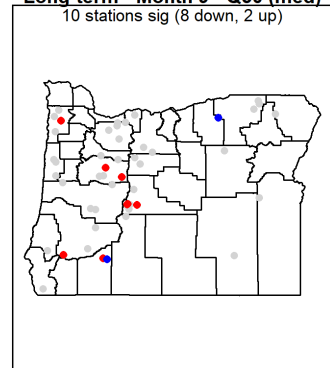
**Long-term - Month 7 - Q50 (med)**  
1 stations sig (1 down, 0 up)



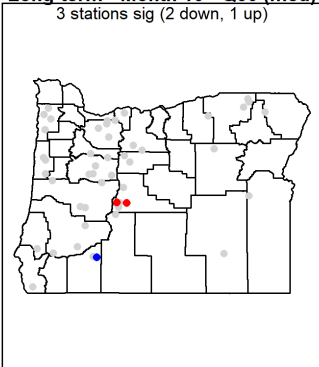
**Long-term - Month 8 - Q50 (med)**  
8 stations sig (7 down, 1 up)



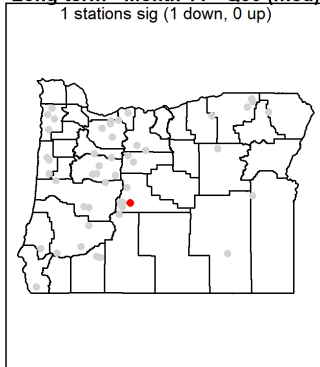
**Long-term - Month 9 - Q50 (med)**  
10 stations sig (8 down, 2 up)



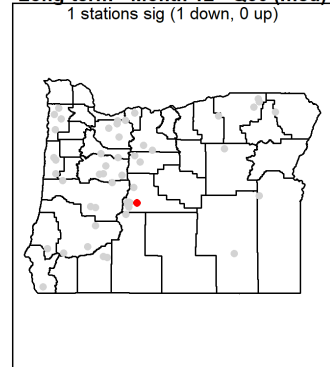
**Long-term - Month 10 - Q50 (med)**  
3 stations sig (2 down, 1 up)



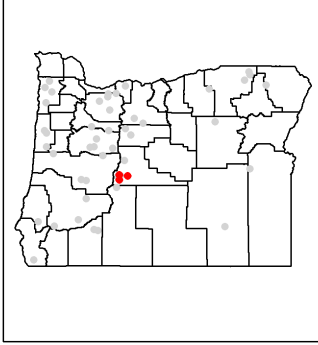
**Long-term - Month 11 - Q50 (med)**  
1 stations sig (1 down, 0 up)



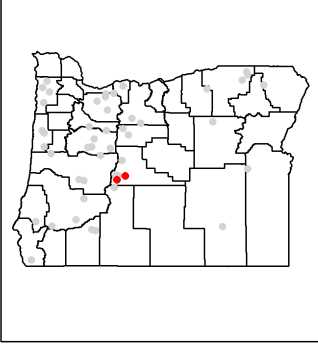
**Long-term - Month 12 - Q50 (med)**  
1 stations sig (1 down, 0 up)



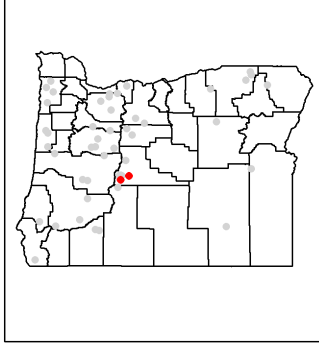
**Long-term - Month 1 - Q80 (high)**  
3 stations sig (3 down, 0 up)



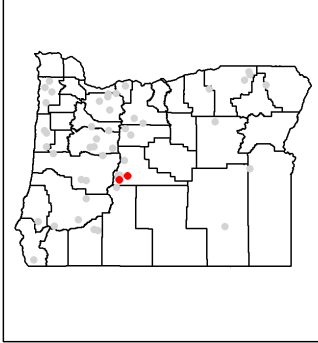
**Long-term - Month 2 - Q80 (high)**  
2 stations sig (2 down, 0 up)



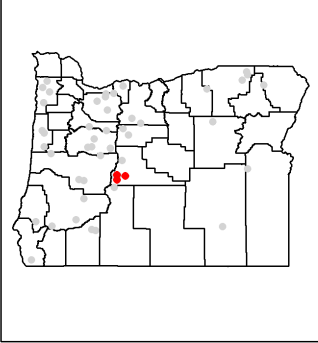
**Long-term - Month 3 - Q80 (high)**  
2 stations sig (2 down, 0 up)



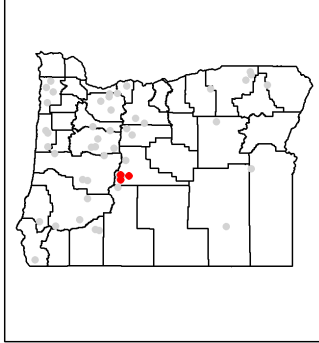
**Long-term - Month 4 - Q80 (high)**  
2 stations sig (2 down, 0 up)



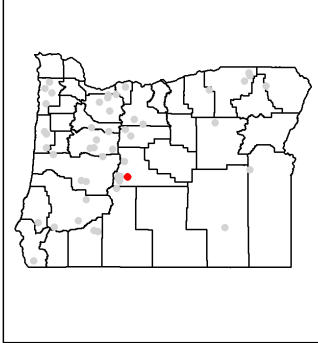
**Long-term - Month 5 - Q80 (high)**  
3 stations sig (3 down, 0 up)



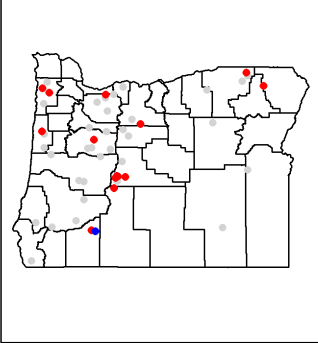
**Long-term - Month 6 - Q80 (high)**  
3 stations sig (3 down, 0 up)



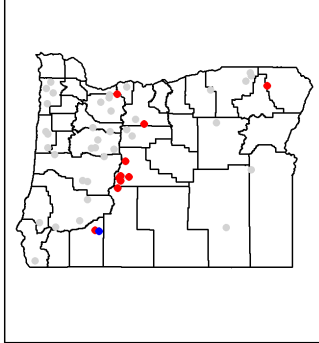
**Long-term - Month 7 - Q80 (high)**  
1 stations sig (1 down, 0 up)



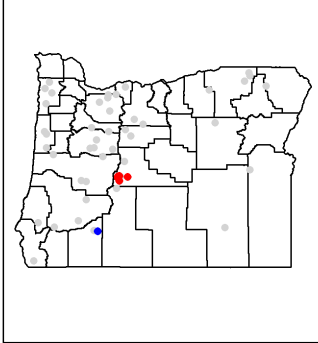
**Long-term - Month 8 - Q80 (high)**  
15 stations sig (14 down, 1 up)



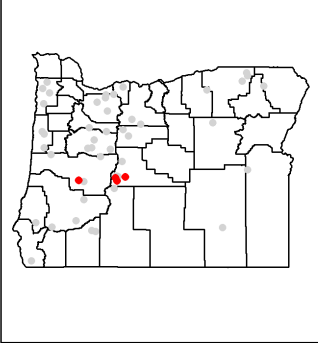
**Long-term - Month 9 - Q80 (high)**  
11 stations sig (10 down, 1 up)



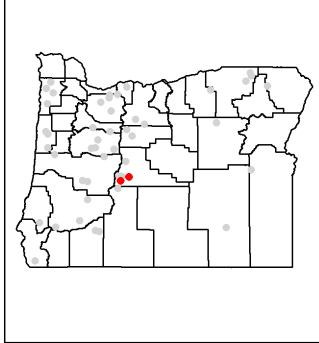
**Long-term - Month 10 - Q80 (high)**  
6 stations sig (5 down, 1 up)

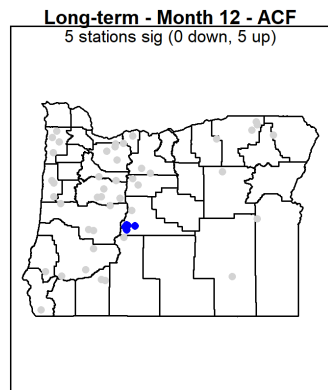
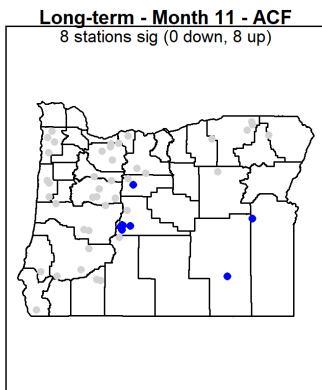
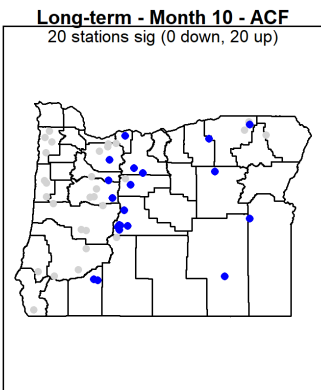
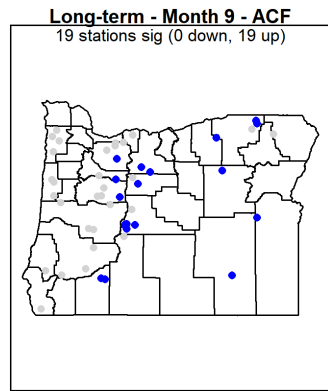
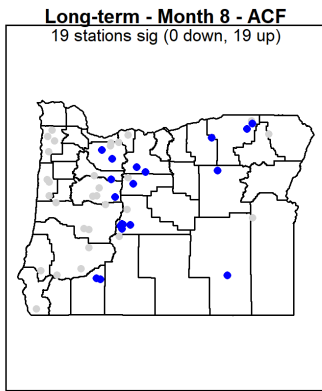
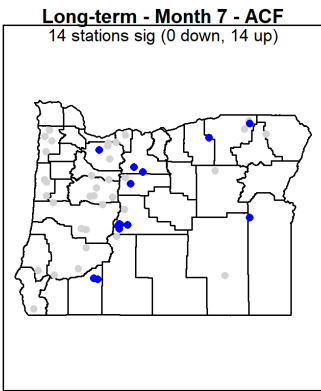
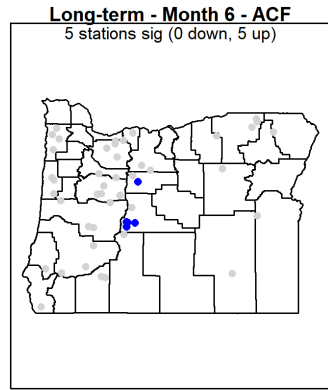
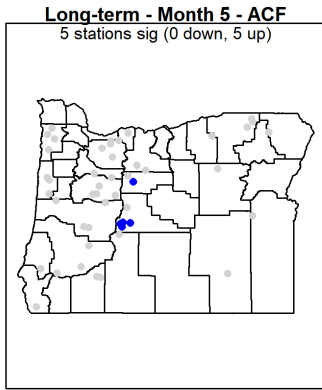
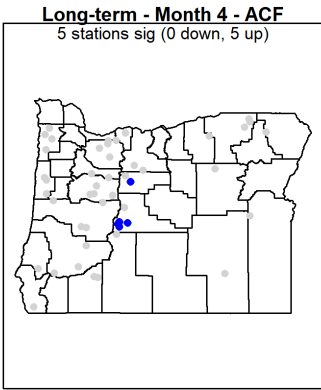
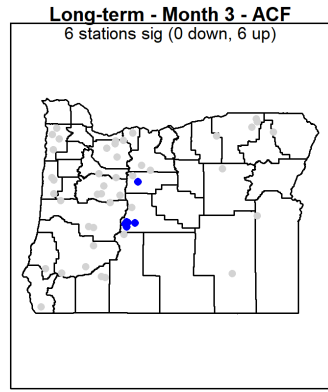
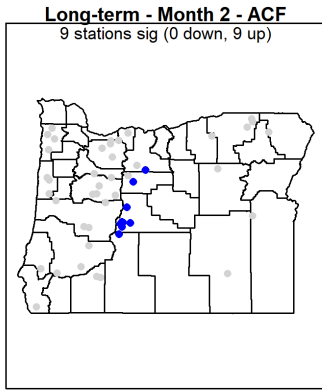
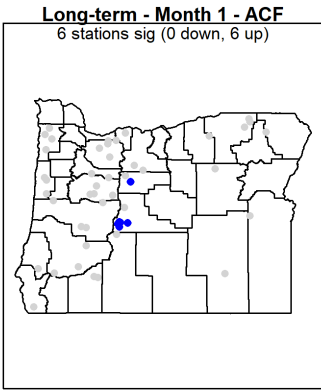


**Long-term - Month 11 - Q80 (high)**  
4 stations sig (4 down, 0 up)



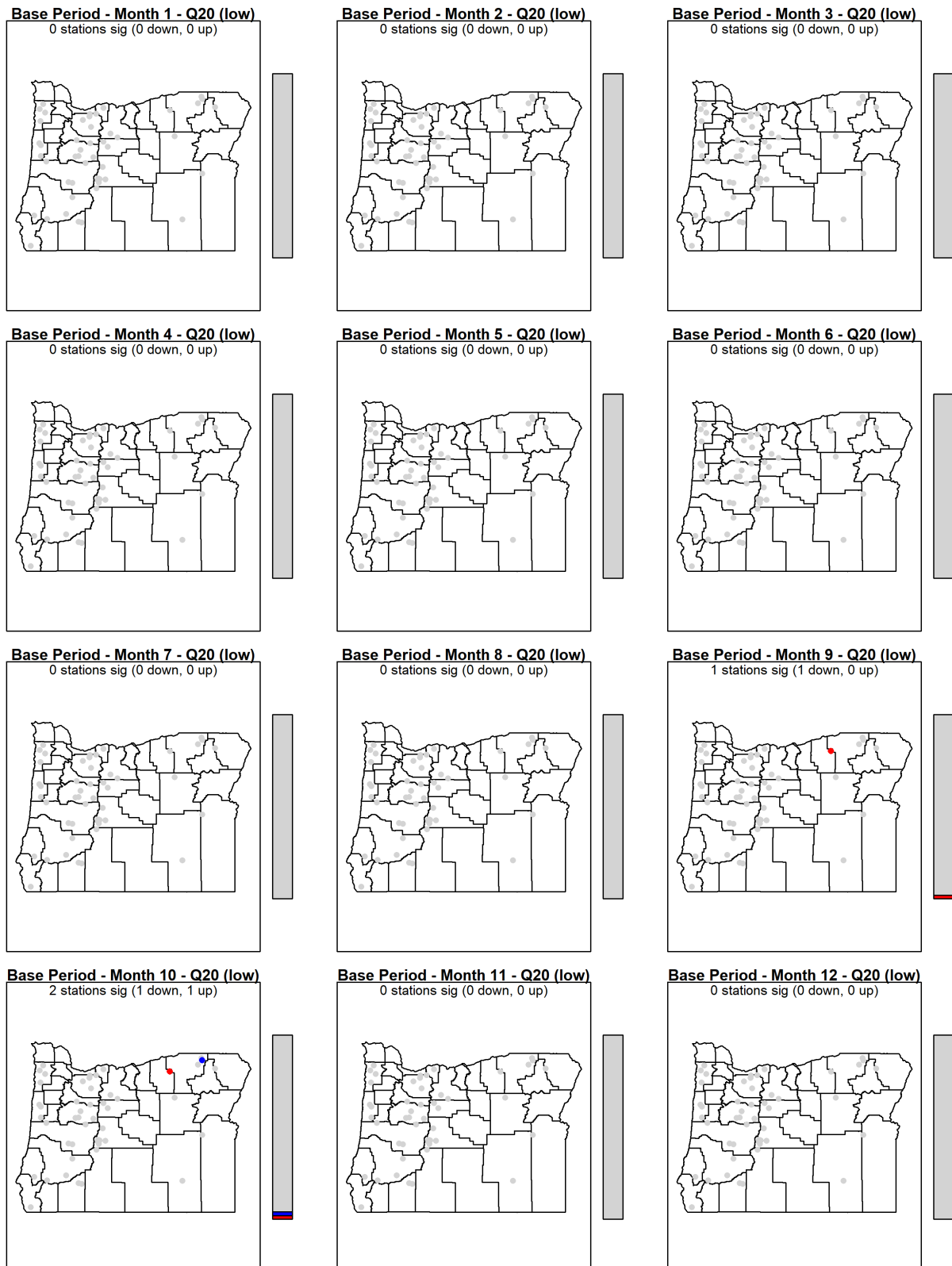
**Long-term - Month 12 - Q80 (high)**  
2 stations sig (2 down, 0 up)



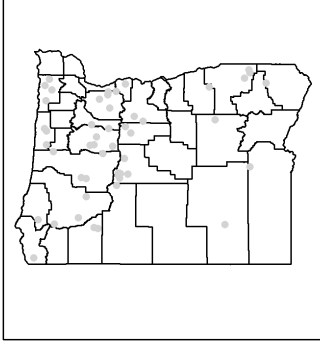


# Appendix G: Additional Maps – Quantile Regression – and Autocorrelation Base Period

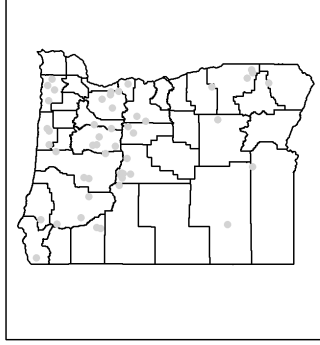
Monthly maps of trend significance of quantile regression of mean monthly flow at 51 stations. Red (blue) indicates significant downward (upward) trend. Record assessed from water years 1991-2020.



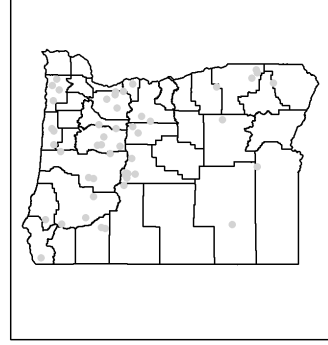
**Base Period - Month 1 - Q50 (med)**  
0 stations sig (0 down, 0 up)



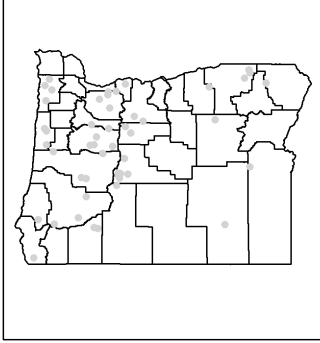
**Base Period - Month 2 - Q50 (med)**  
0 stations sig (0 down, 0 up)



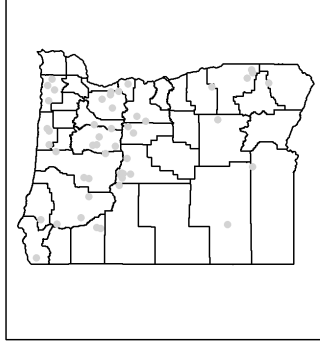
**Base Period - Month 3 - Q50 (med)**  
0 stations sig (0 down, 0 up)



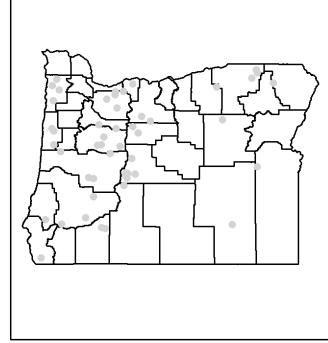
**Base Period - Month 4 - Q50 (med)**  
0 stations sig (0 down, 0 up)



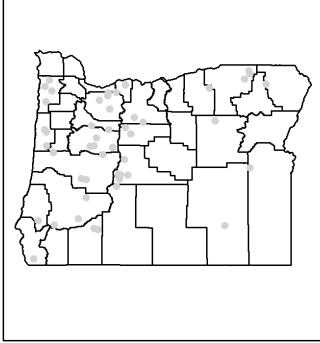
**Base Period - Month 5 - Q50 (med)**  
0 stations sig (0 down, 0 up)



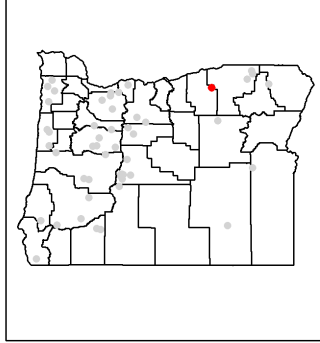
**Base Period - Month 6 - Q50 (med)**  
0 stations sig (0 down, 0 up)



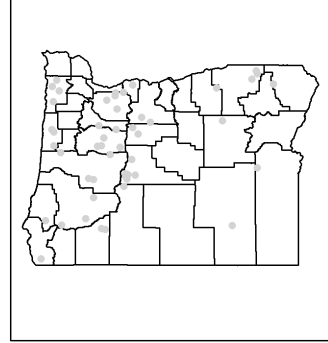
**Base Period - Month 7 - Q50 (med)**  
0 stations sig (0 down, 0 up)



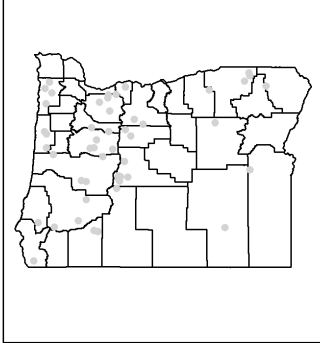
**Base Period - Month 8 - Q50 (med)**  
1 stations sig (1 down, 0 up)



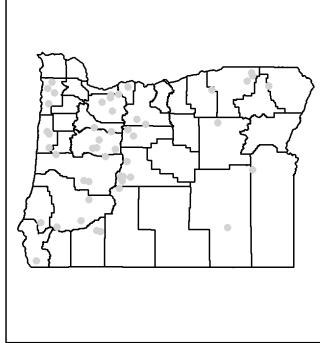
**Base Period - Month 9 - Q50 (med)**  
0 stations sig (0 down, 0 up)



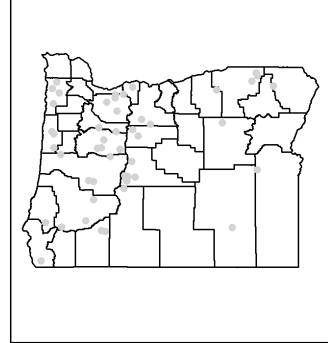
**Base Period - Month 10 - Q50 (med)**  
0 stations sig (0 down, 0 up)



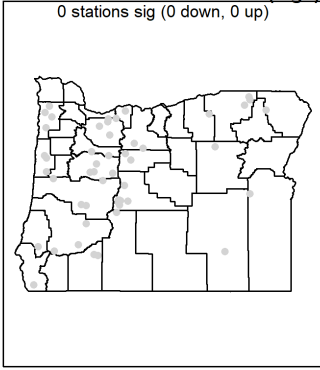
**Base Period - Month 11 - Q50 (med)**  
0 stations sig (0 down, 0 up)



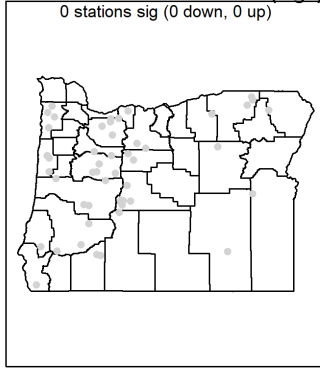
**Base Period - Month 12 - Q50 (med)**  
0 stations sig (0 down, 0 up)



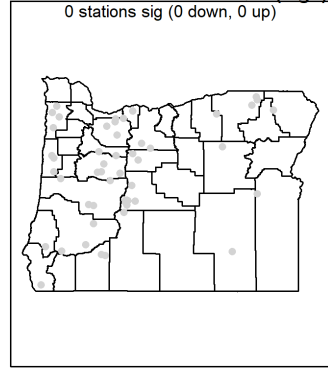
**Base Period - Month 1 - Q80 (high)**  
0 stations sig (0 down, 0 up)



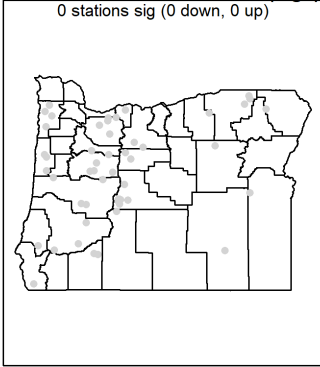
**Base Period - Month 2 - Q80 (high)**  
0 stations sig (0 down, 0 up)



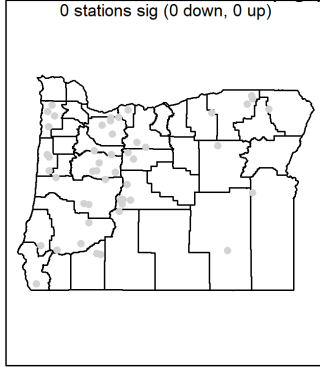
**Base Period - Month 3 - Q80 (high)**  
0 stations sig (0 down, 0 up)



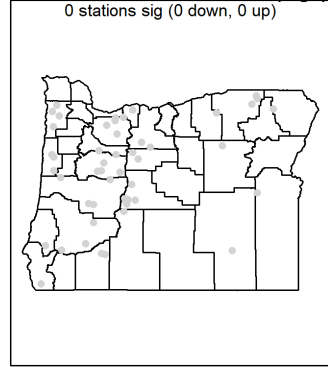
**Base Period - Month 4 - Q80 (high)**  
0 stations sig (0 down, 0 up)



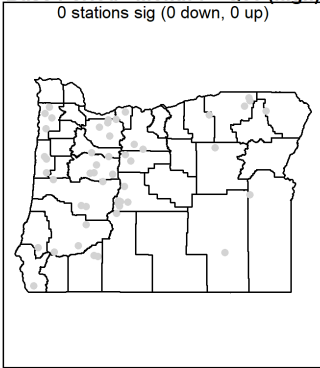
**Base Period - Month 5 - Q80 (high)**  
0 stations sig (0 down, 0 up)



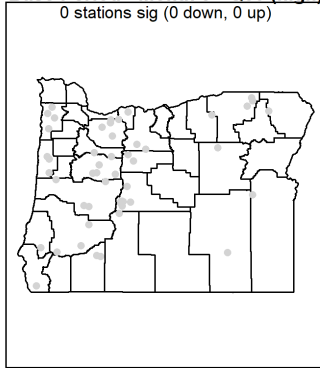
**Base Period - Month 6 - Q80 (high)**  
0 stations sig (0 down, 0 up)



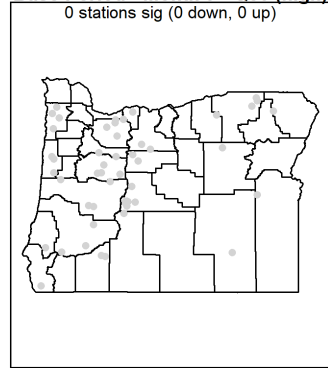
**Base Period - Month 7 - Q80 (high)**  
0 stations sig (0 down, 0 up)



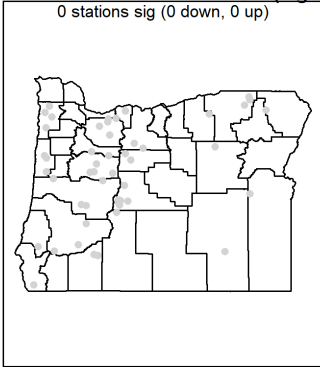
**Base Period - Month 8 - Q80 (high)**  
0 stations sig (0 down, 0 up)



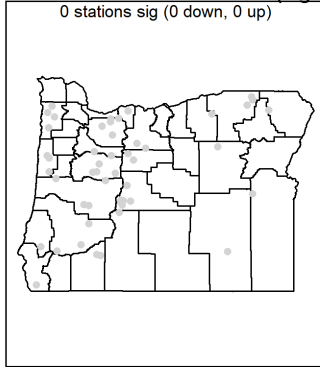
**Base Period - Month 9 - Q80 (high)**  
0 stations sig (0 down, 0 up)



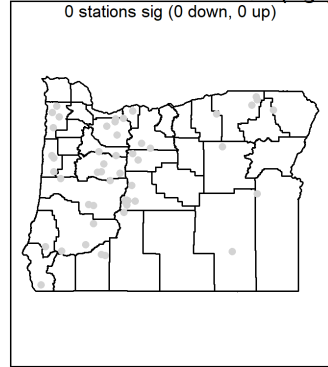
**Base Period - Month 10 - Q80 (high)**  
0 stations sig (0 down, 0 up)

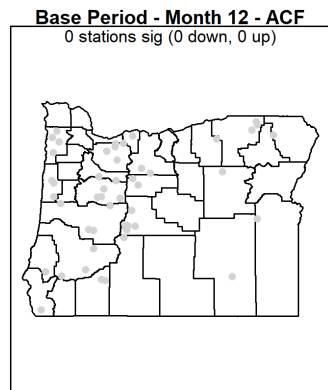
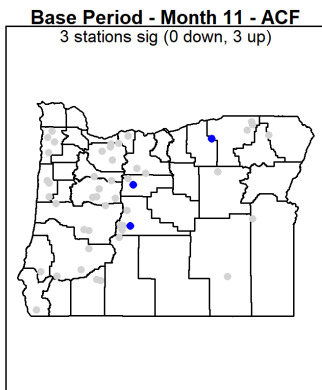
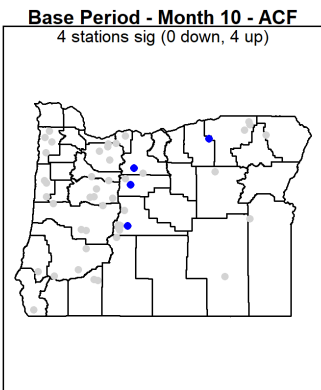
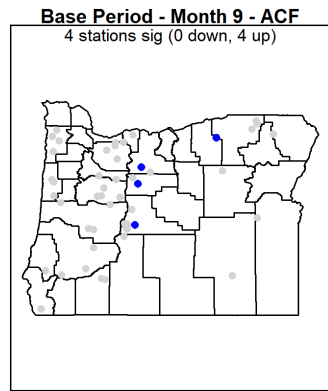
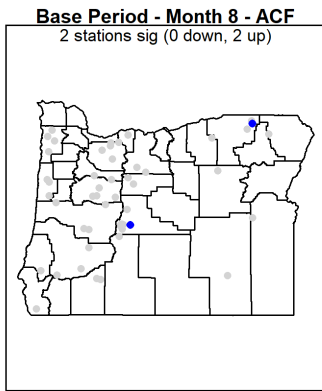
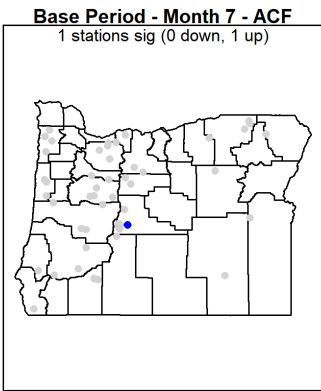
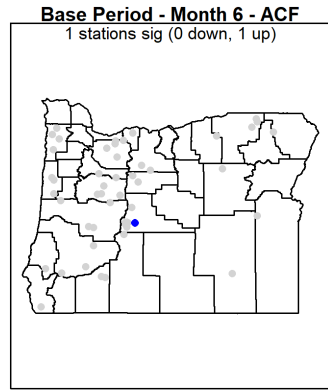
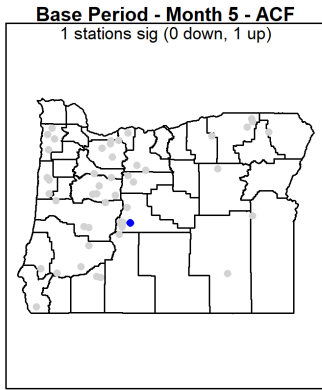
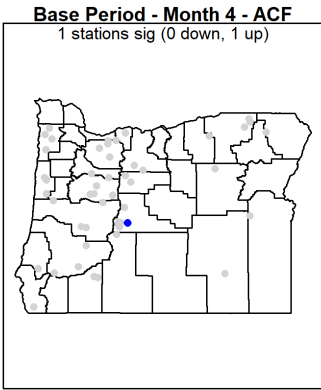
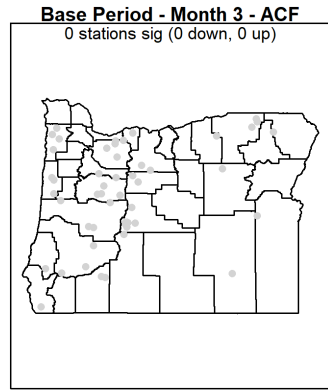
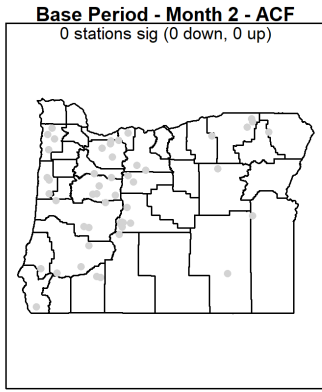
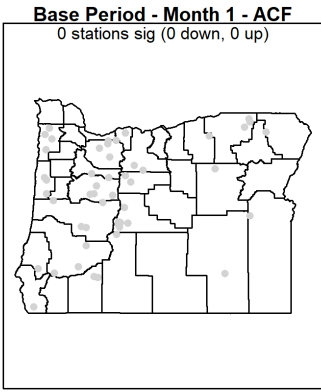


**Base Period - Month 11 - Q80 (high)**  
0 stations sig (0 down, 0 up)



**Base Period - Month 12 - Q80 (high)**  
0 stations sig (0 down, 0 up)



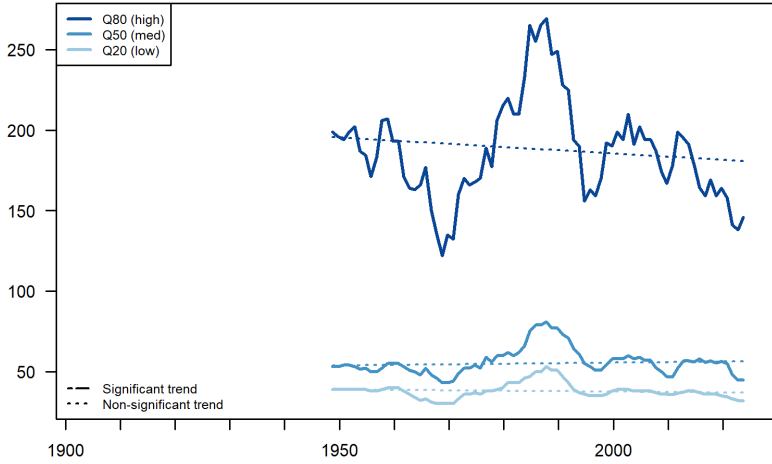


## Appendix H: Individual Station Results – Moving Window Percentile Analysis– Long-term Period

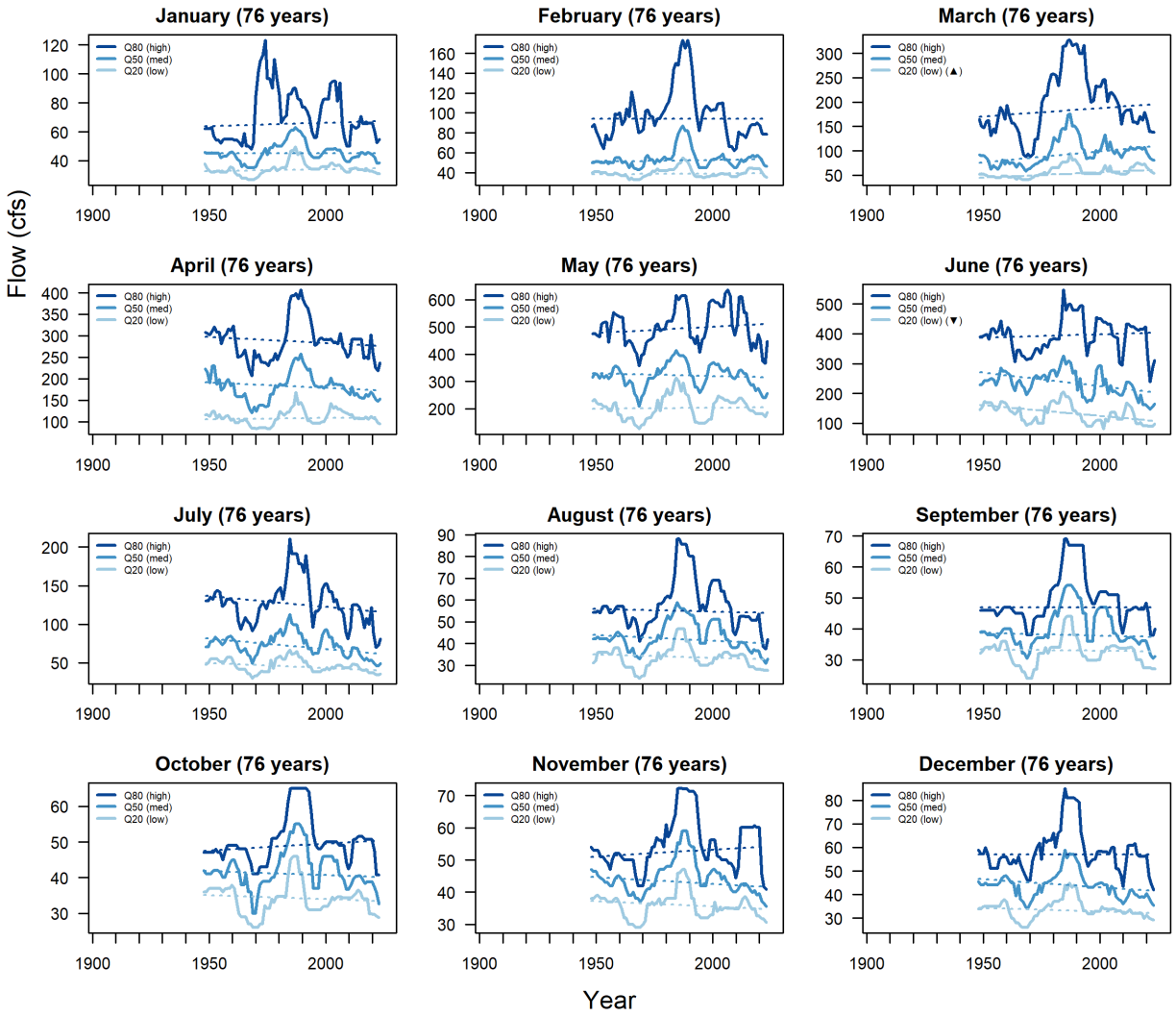
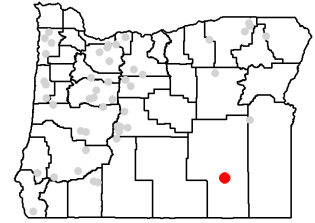
Trend analysis of 10-year moving percentiles for streamflow stations for the long-term period (35 to 115 years). Each figure shows the 10-year moving average annual flow (top panel) and monthly flows (12 smaller panels) for 20th, 50th, and 80th non-exceedance percentile (Q) flows. Upward (▲) and downward (▼) triangles in legends indicate significant trends ( $p < 0.05$ ). Trendlines superimposed over time series data; dotted line is non-significant, while dashed line is significant. Note that y-axis varies among subplots within the same figure.

LT Flow Trends for Station #10396000

Annual Flow at Station #10396000 (76 years, 1948-2023)

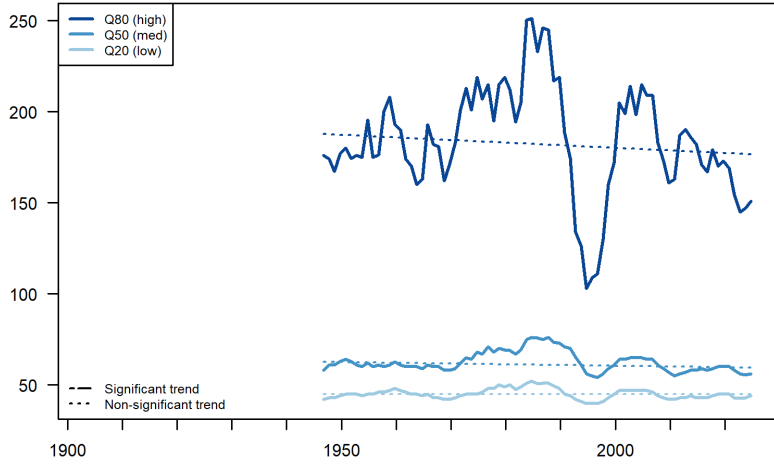


Station #10396000

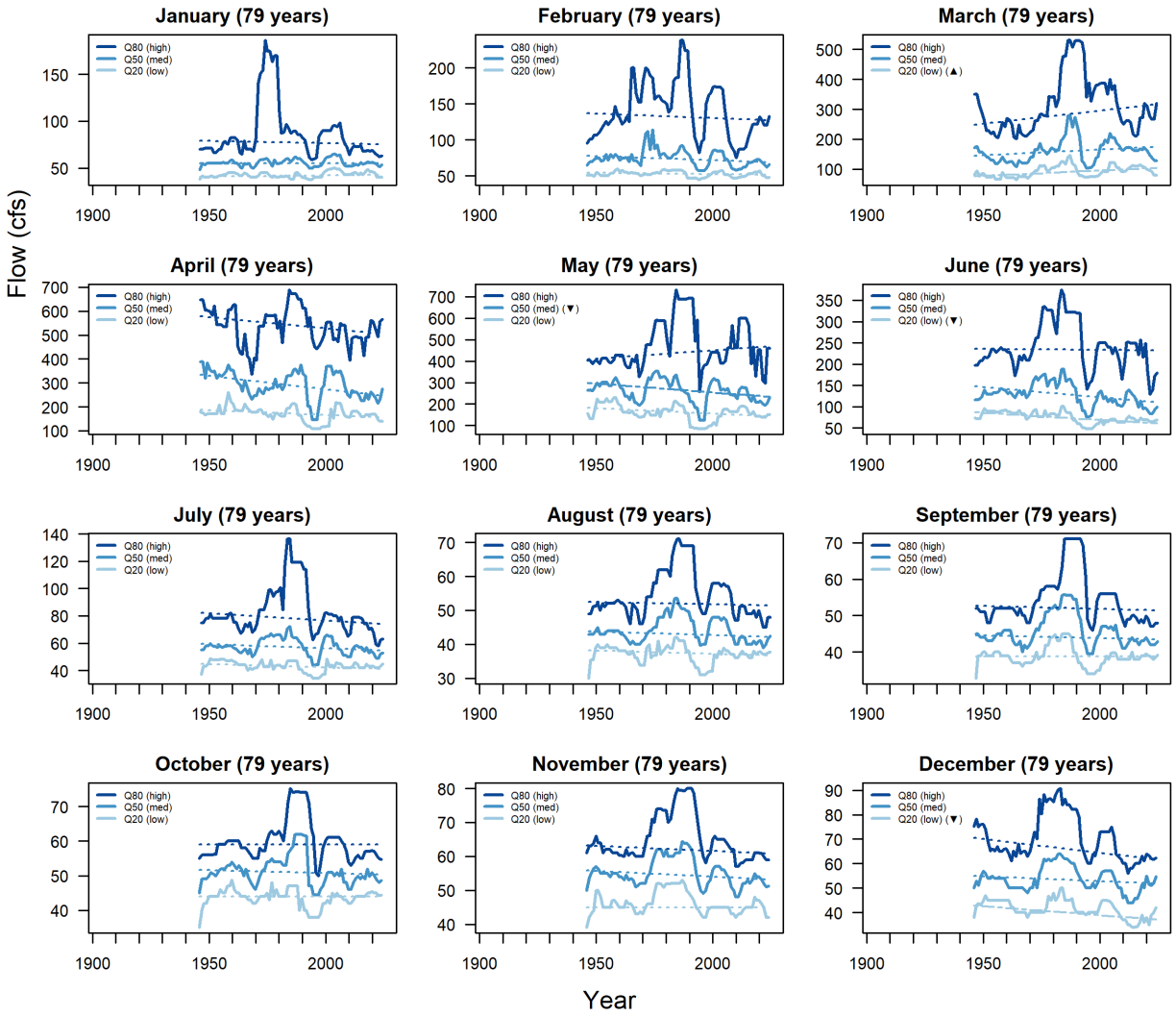
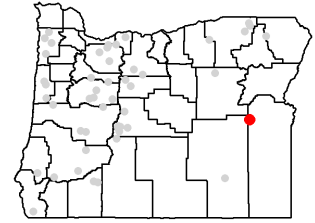


LT Flow Trends for Station #13216500

Annual Flow at Station #13216500 (79 years, 1946-2024)

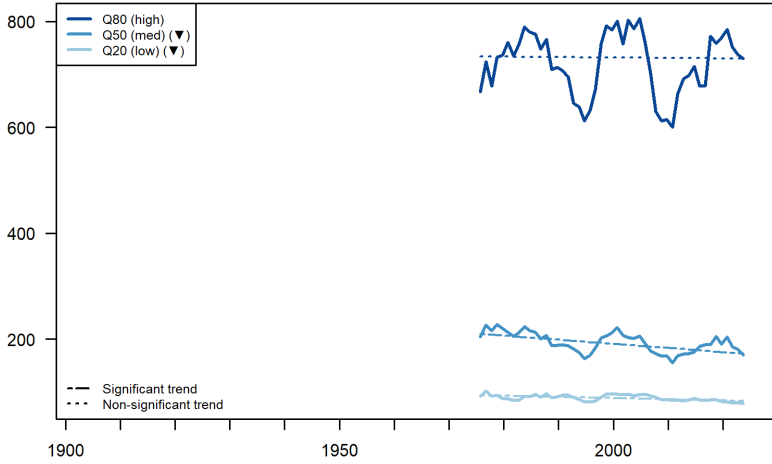


Station #13216500

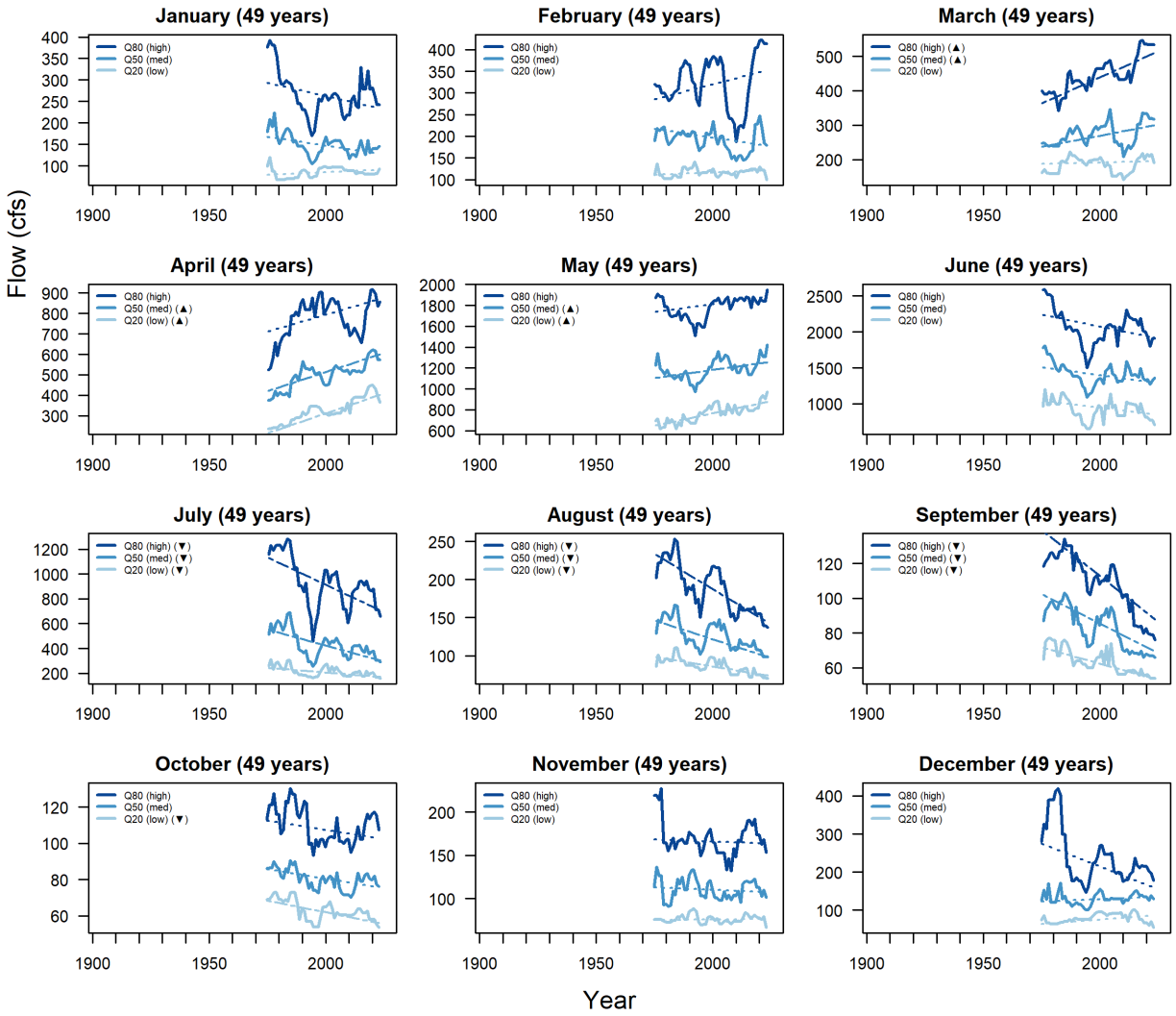
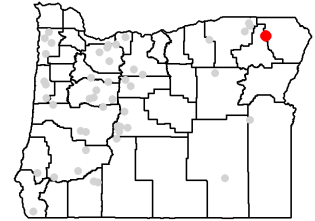


LT Flow Trends for Station #13331500

Annual Flow at Station #13331500 (49 years, 1975-2023)

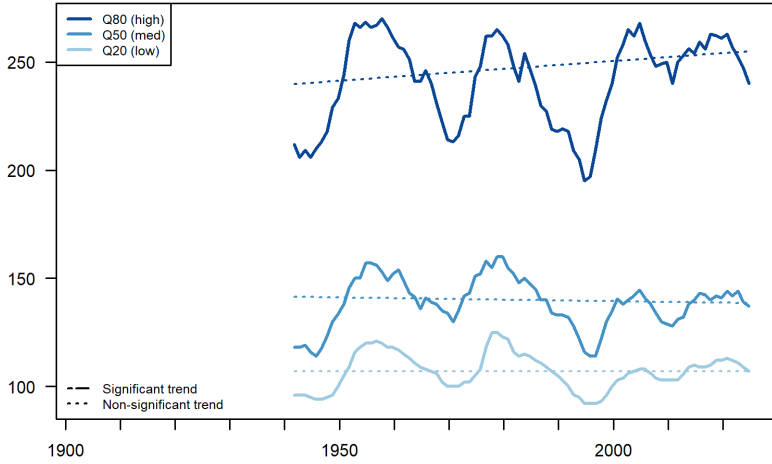


Station #13331500

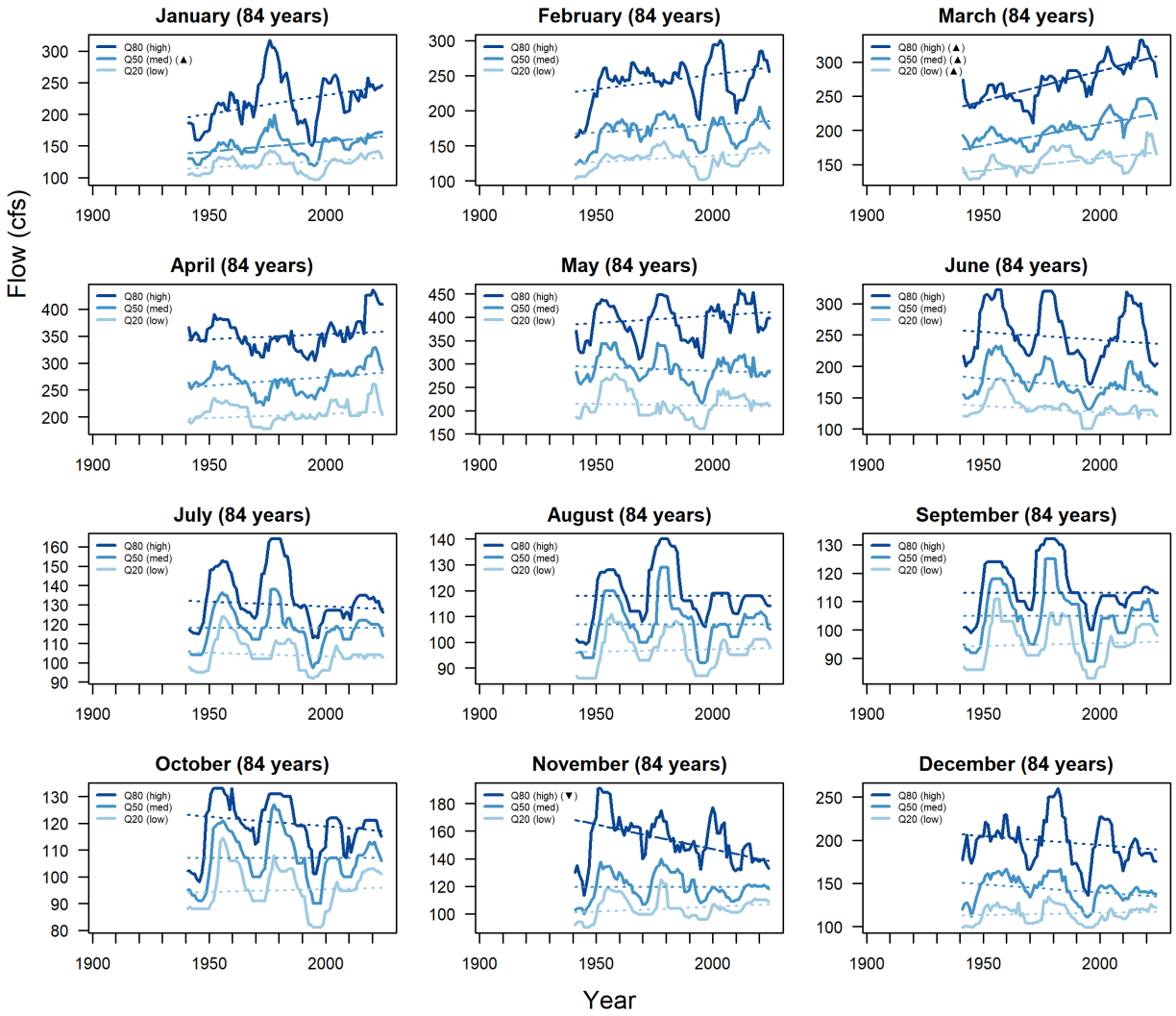
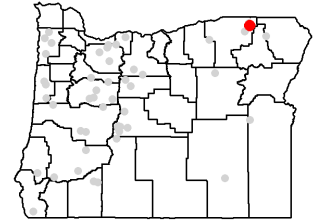


LT Flow Trends for Station #14010000

Annual Flow at Station #14010000 (84 years, 1941-2024)

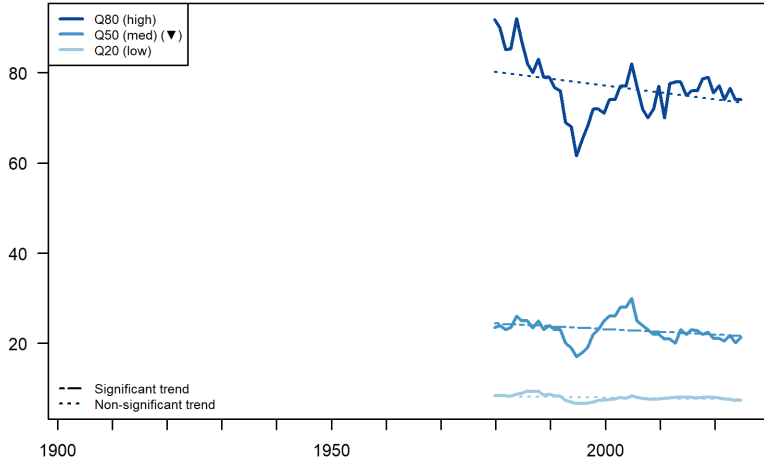


Station #14010000

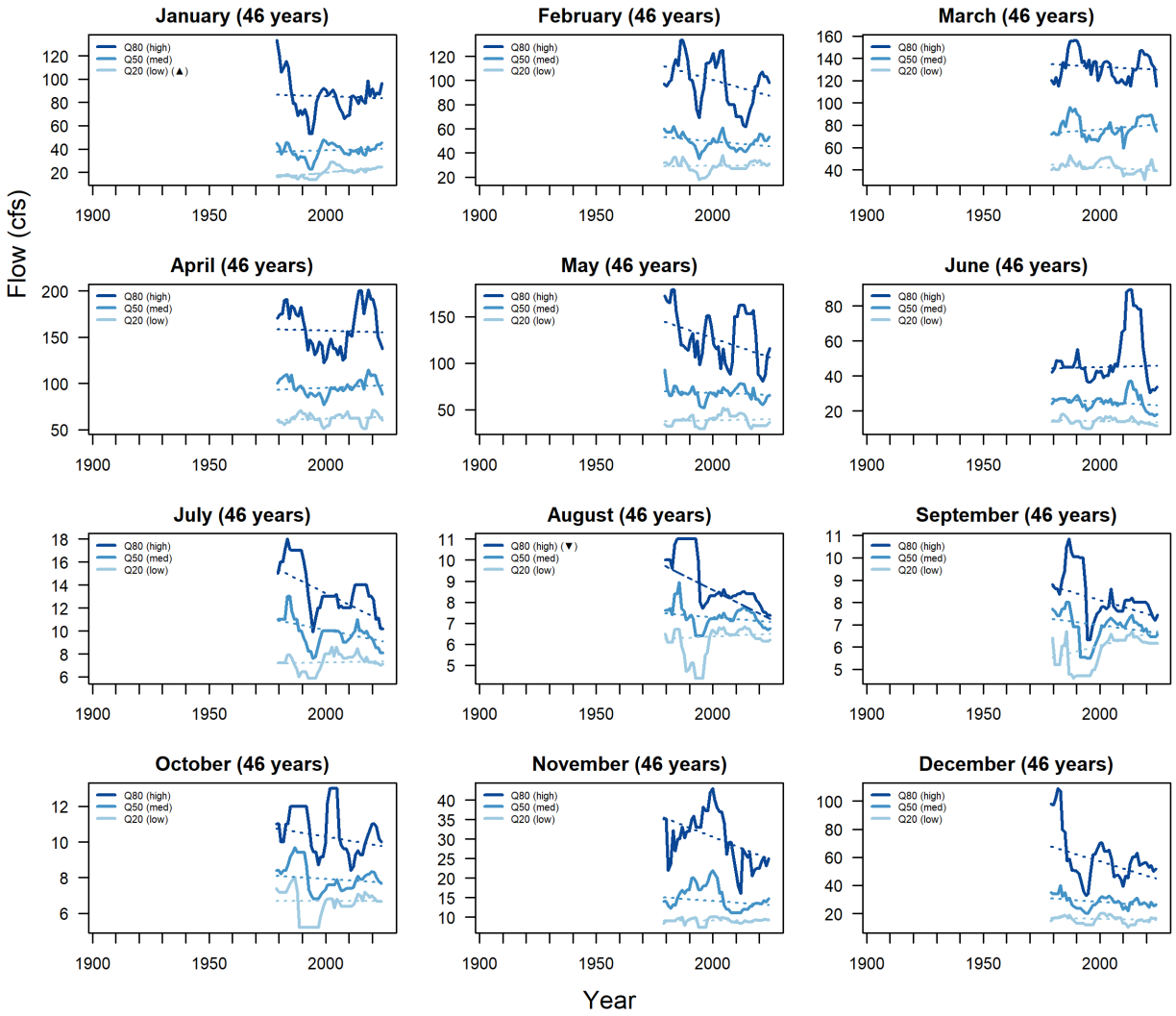
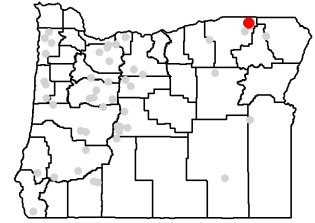


LT Flow Trends for Station #14010800

Annual Flow at Station #14010800 (46 years, 1979-2024)

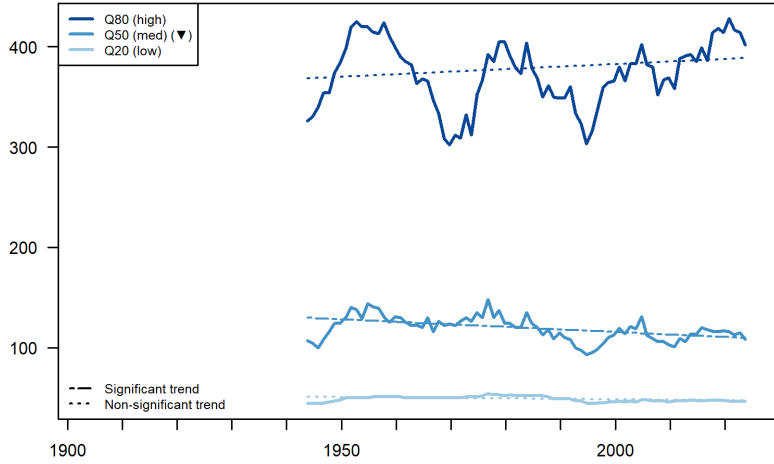


Station #14010800

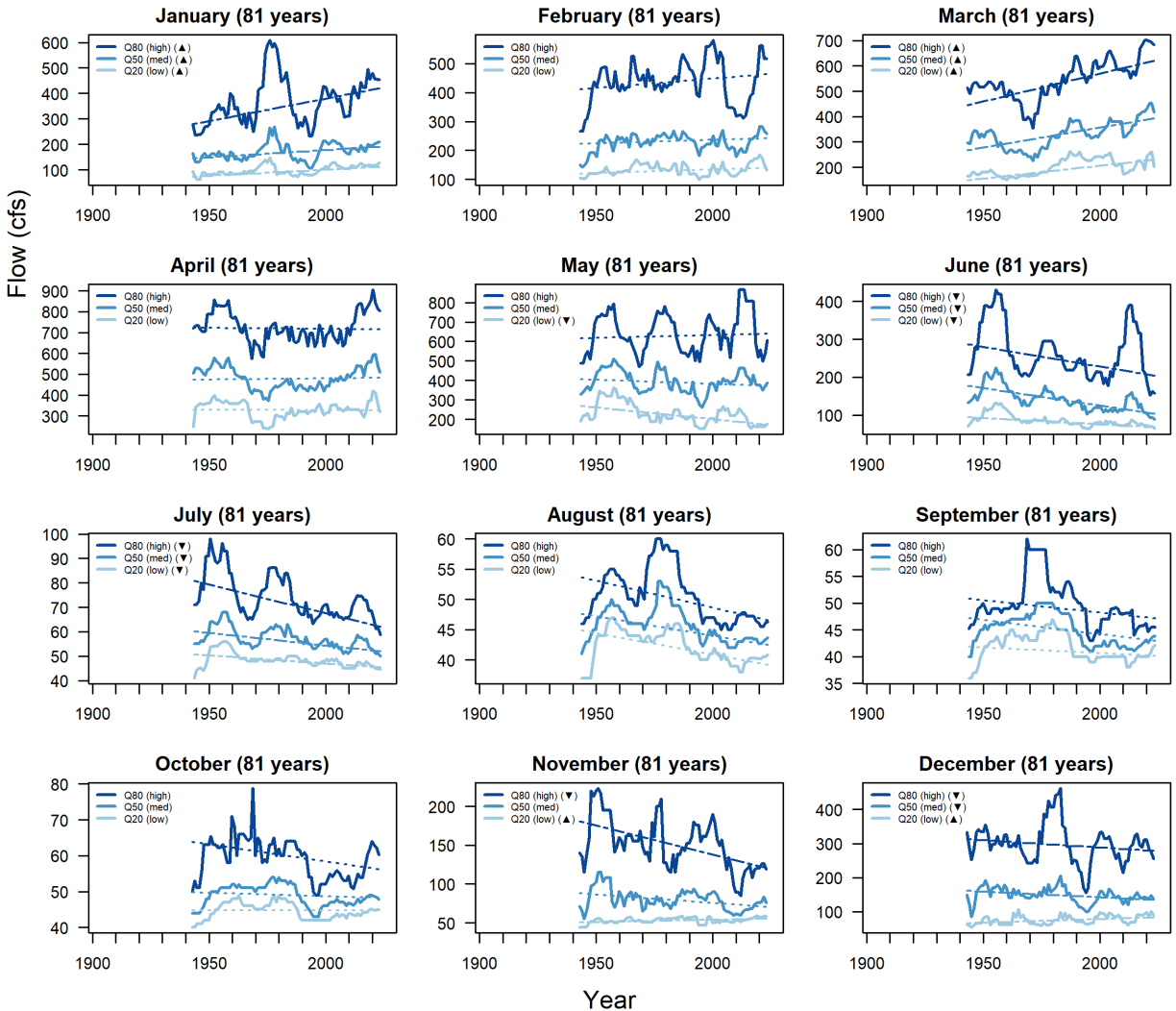
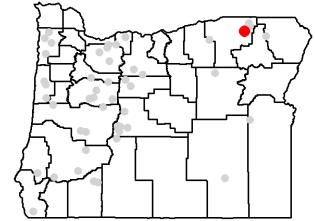


LT Flow Trends for Station #14020000

Annual Flow at Station #14020000 (81 years, 1943-2023)

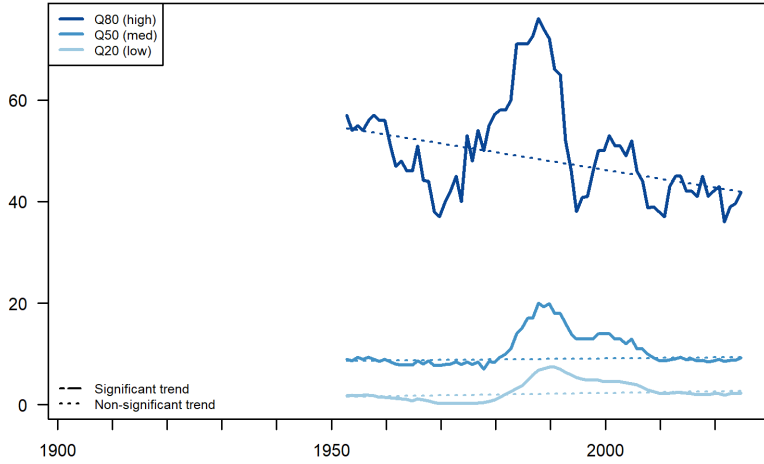


Station #14020000

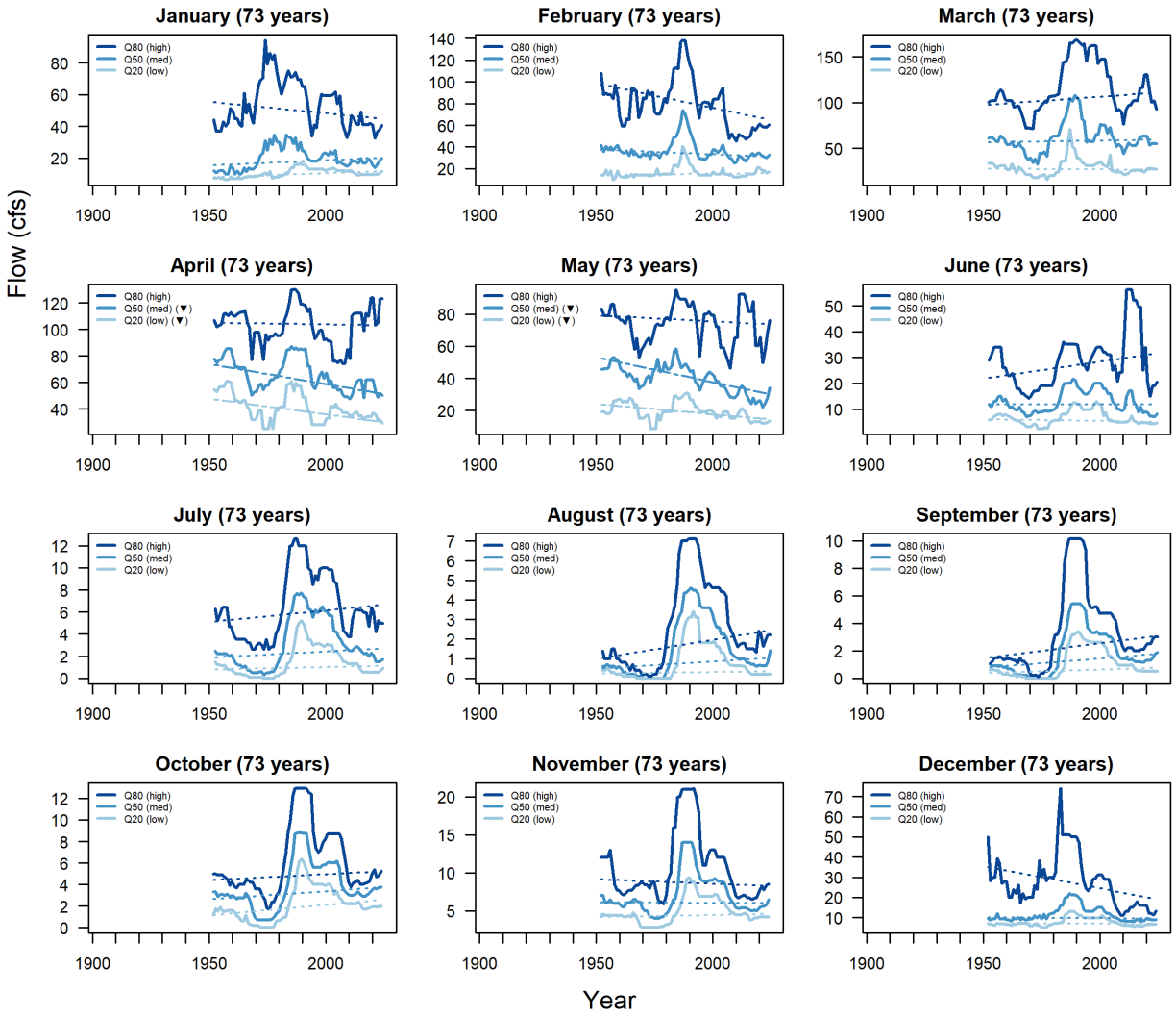
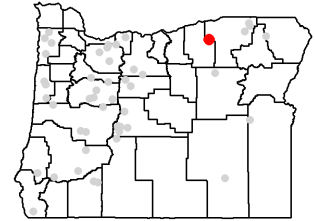


LT Flow Trends for Station #14032000

Annual Flow at Station #14032000 (73 years, 1952-2024)

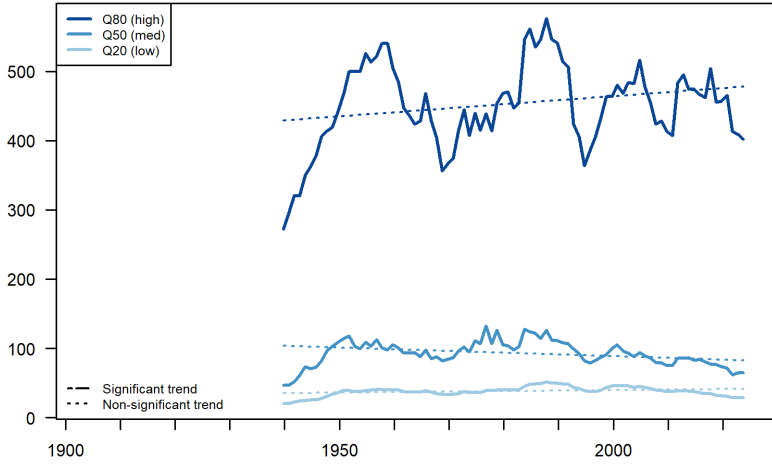


Station #14032000

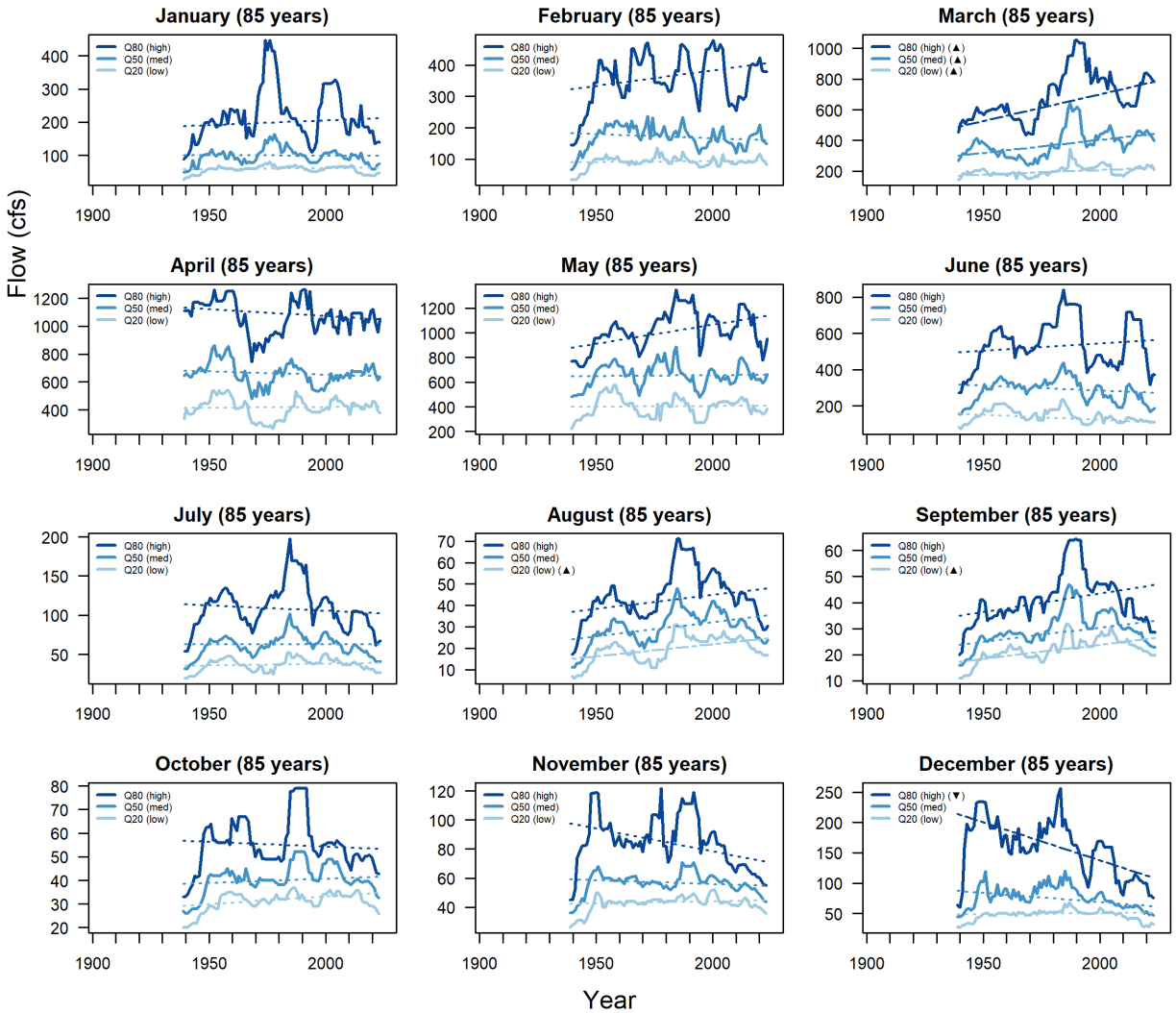
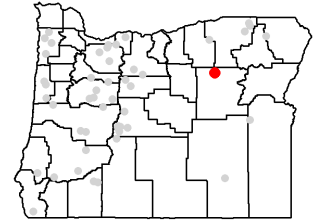


LT Flow Trends for Station #14044000

Annual Flow at Station #14044000 (85 years, 1939-2023)

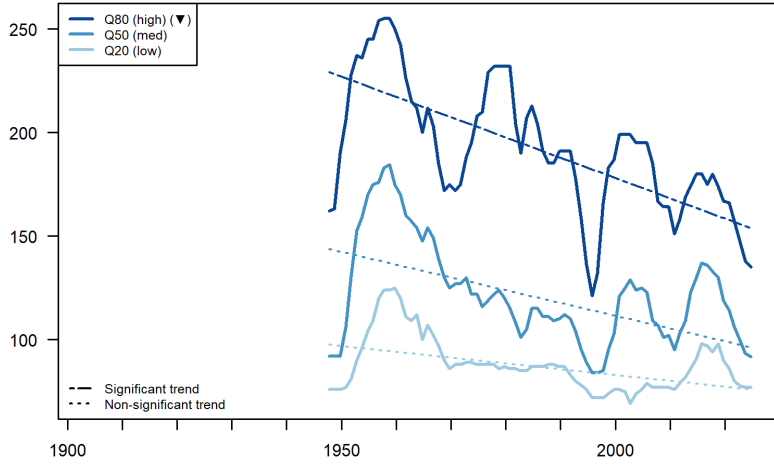


Station #14044000

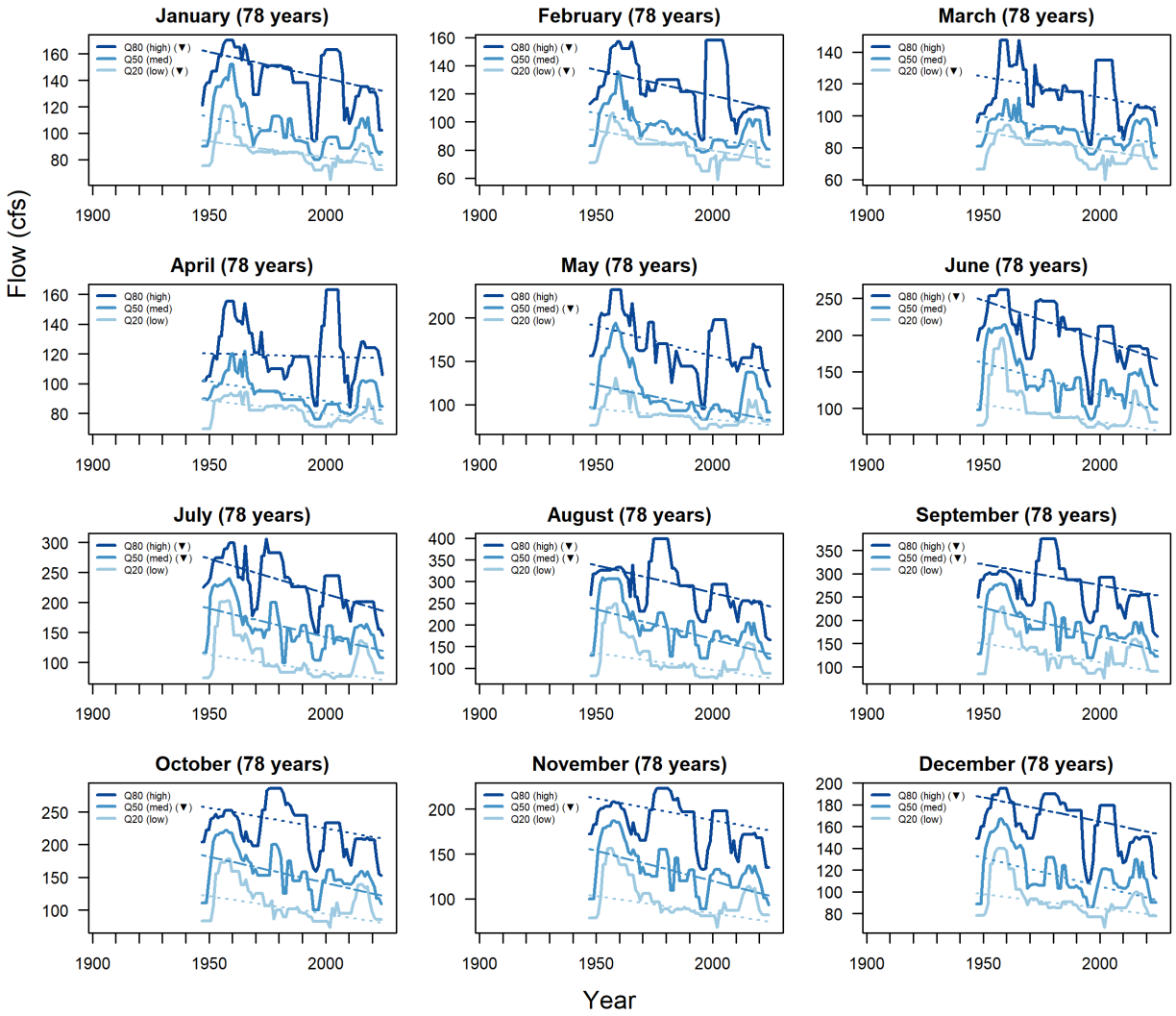
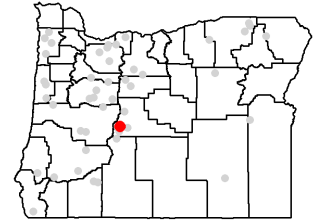


LT Flow Trends for Station #14050000

Annual Flow at Station #14050000 (78 years, 1947-2024)

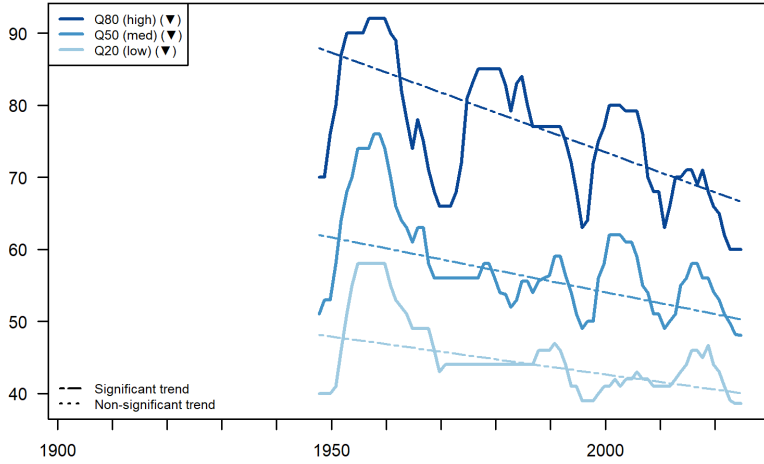


Station #14050000

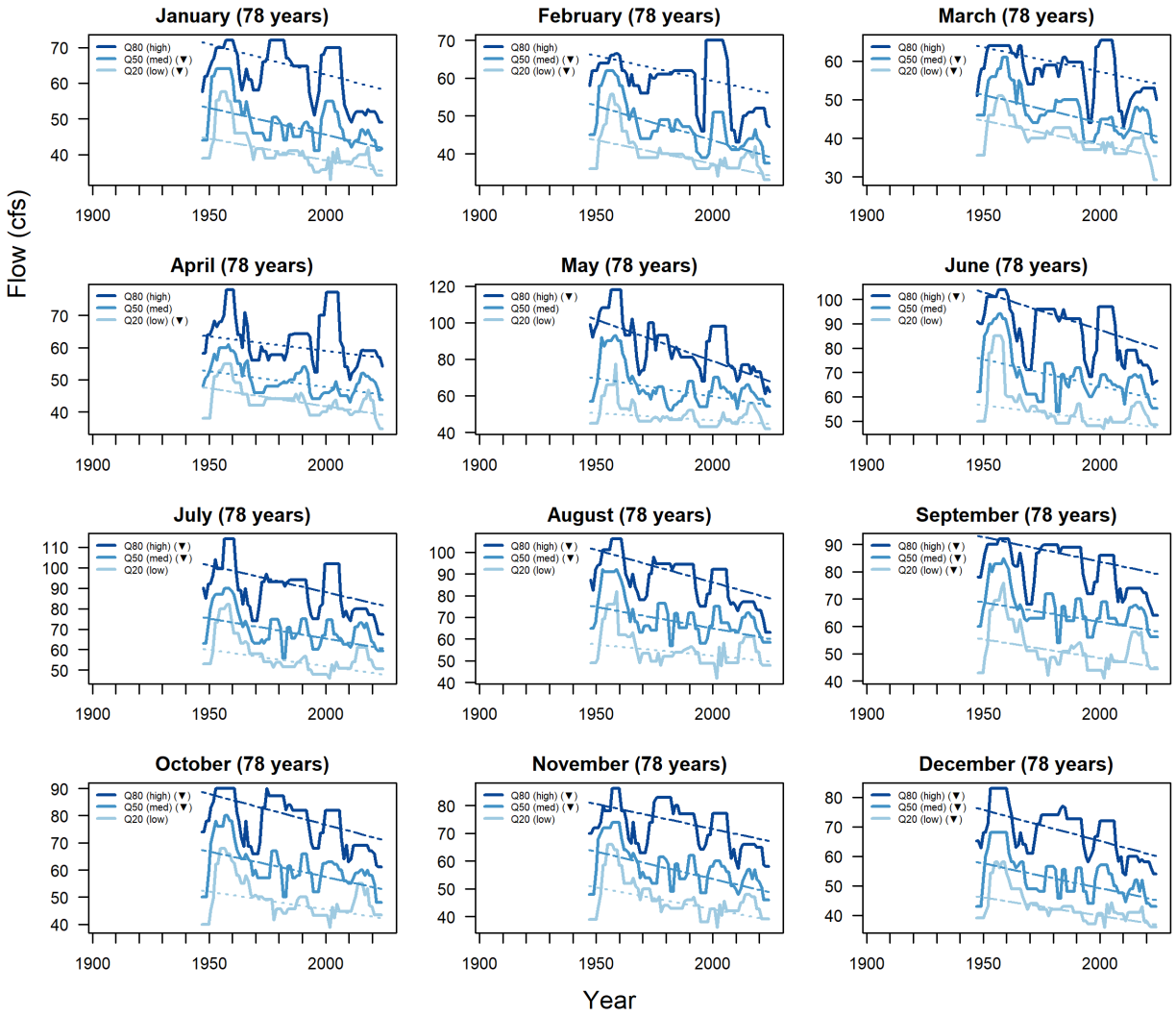
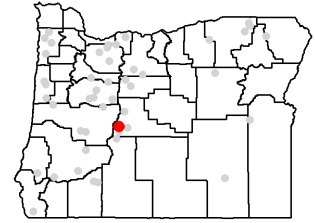


LT Flow Trends for Station #14050500

Annual Flow at Station #14050500 (78 years, 1947-2024)

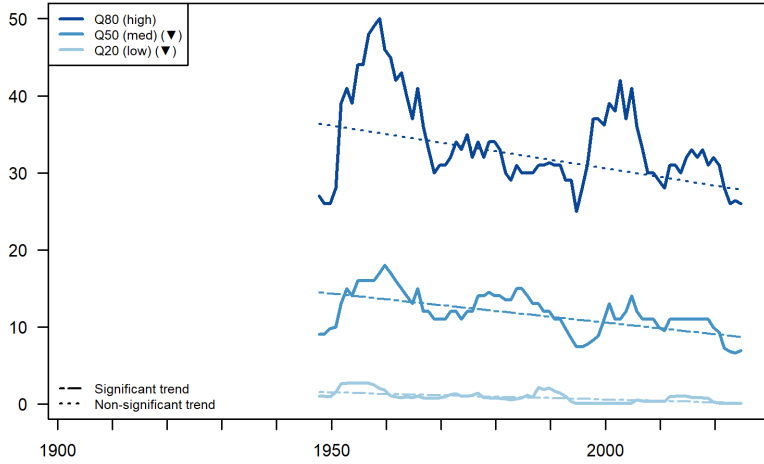


Station #14050500

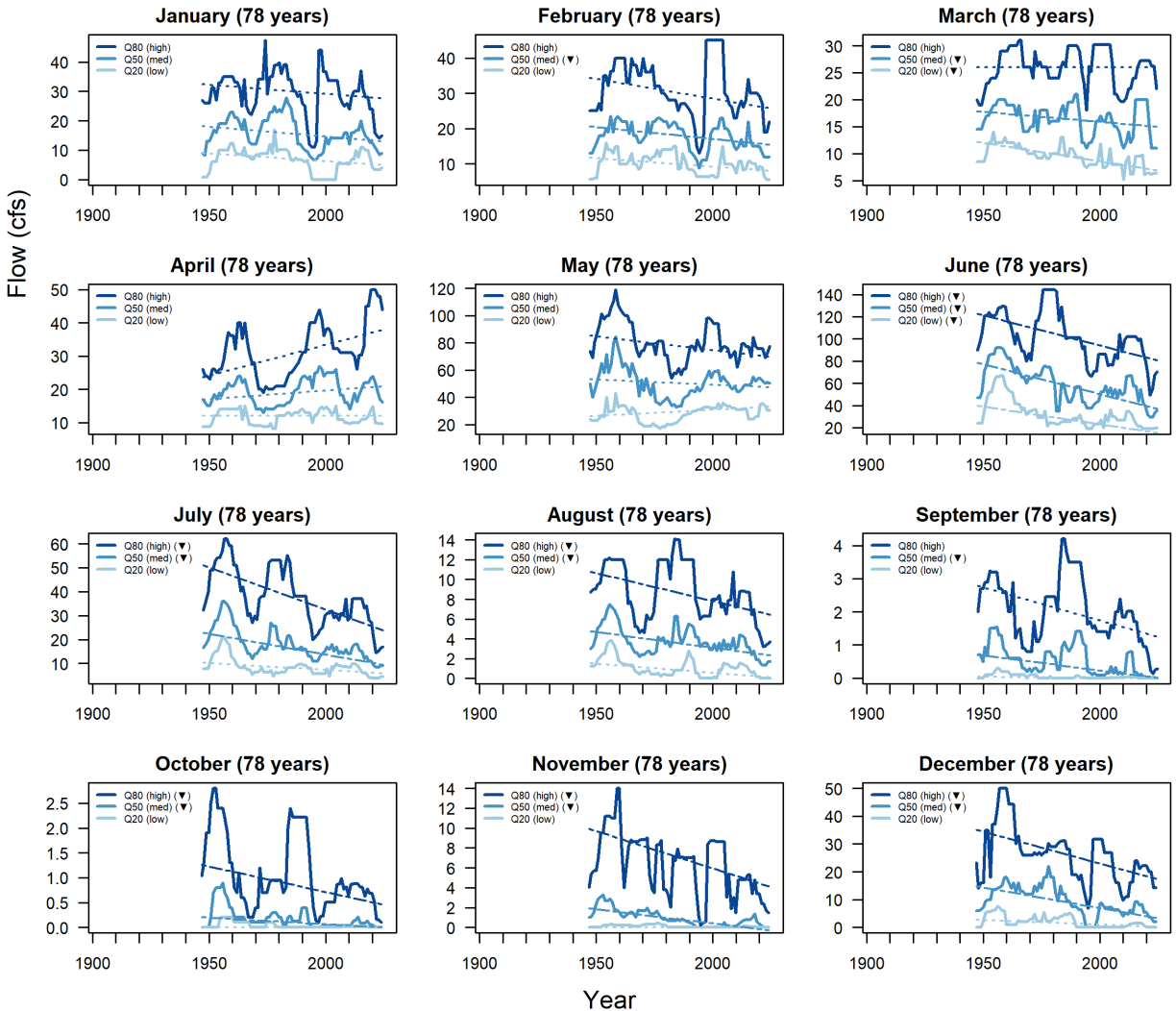
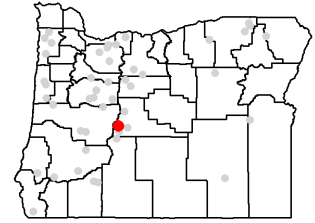


LT Flow Trends for Station #14051000

Annual Flow at Station #14051000 (78 years, 1947-2024)

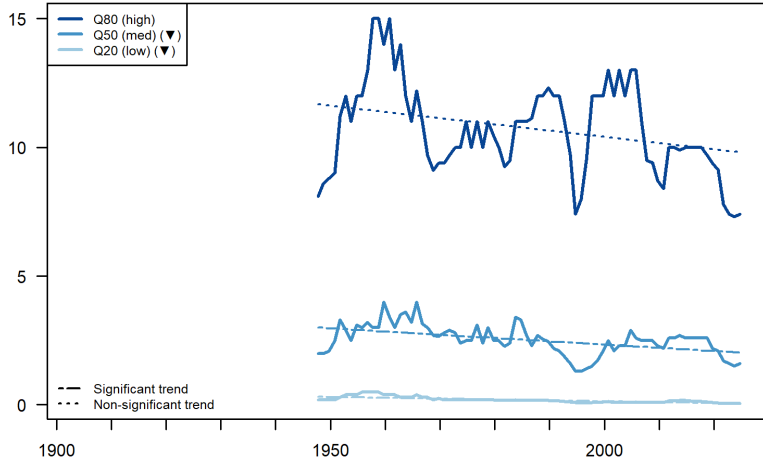


Station #14051000

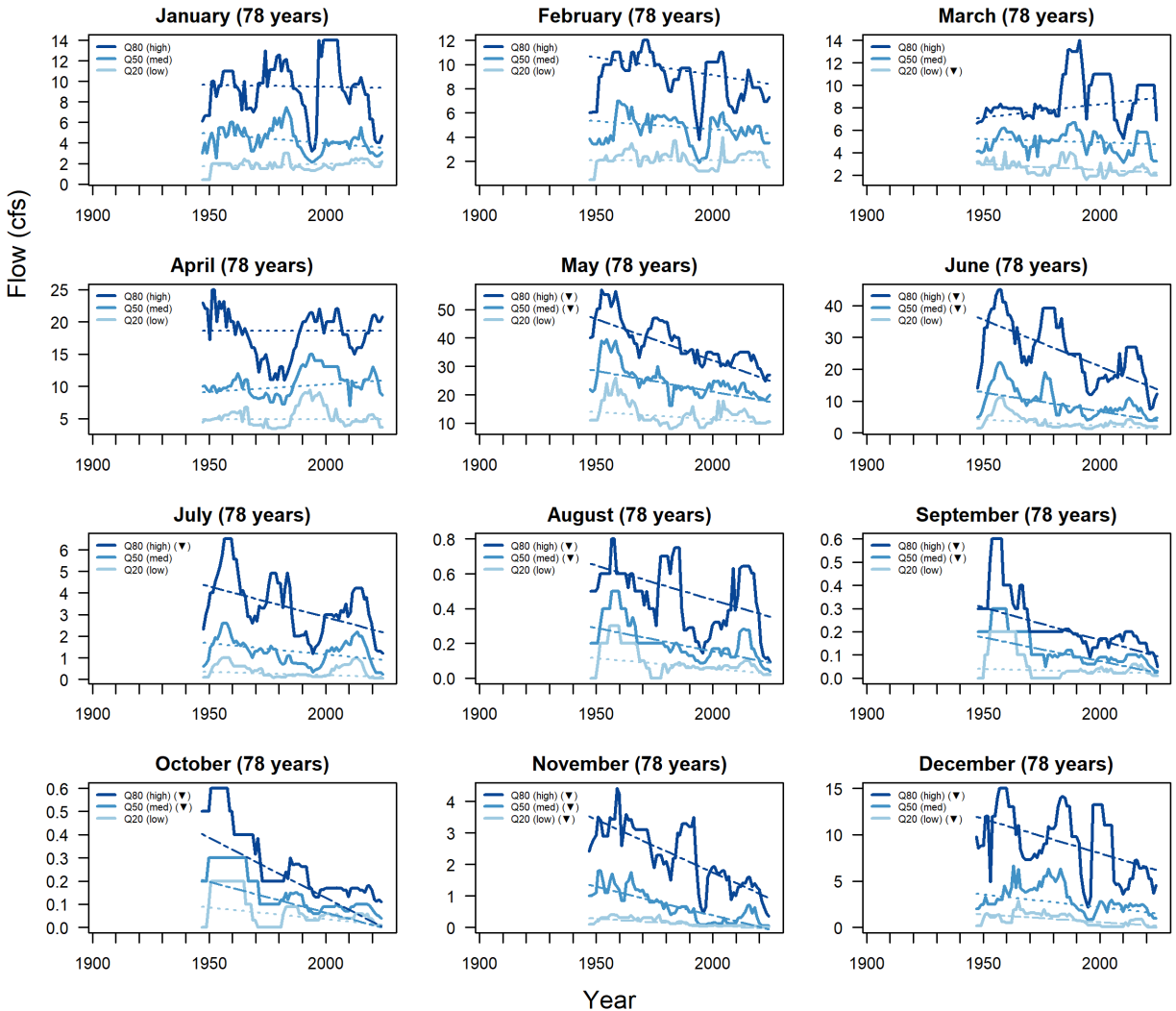
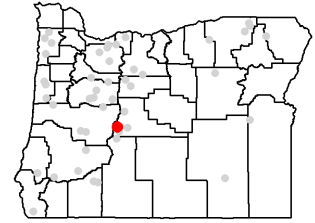


LT Flow Trends for Station #14052000

Annual Flow at Station #14052000 (78 years, 1947-2024)

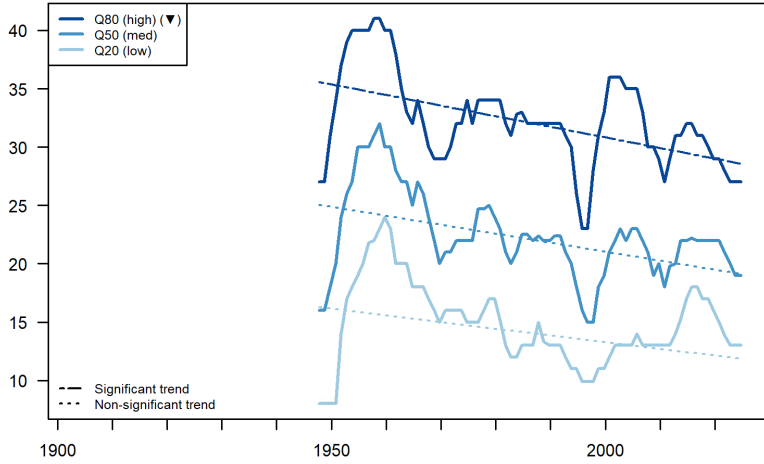


Station #14052000

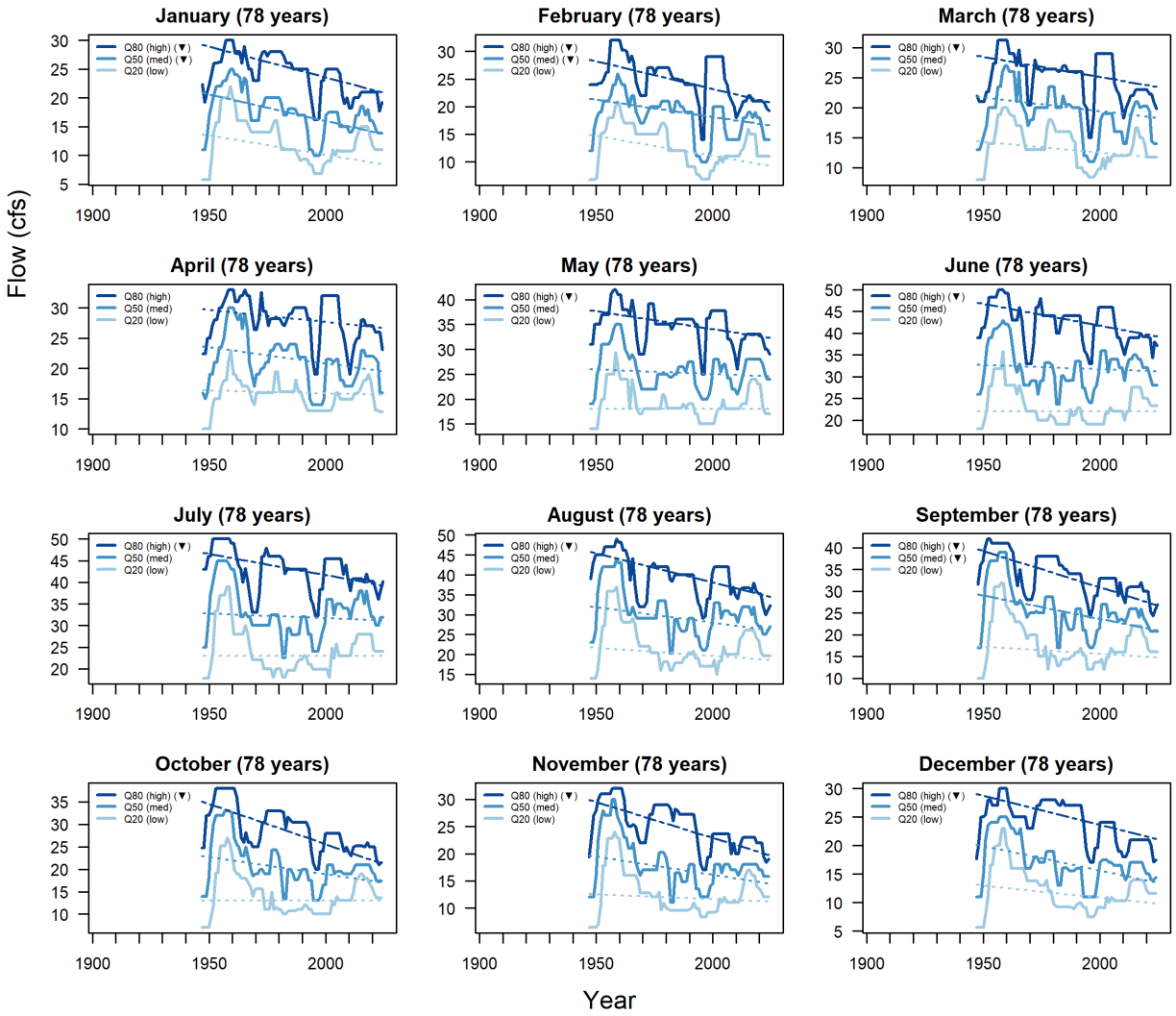
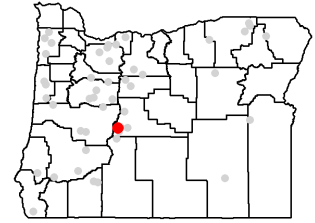


# LT Flow Trends for Station #14052500

## Annual Flow at Station #14052500 (78 years, 1947-2024)

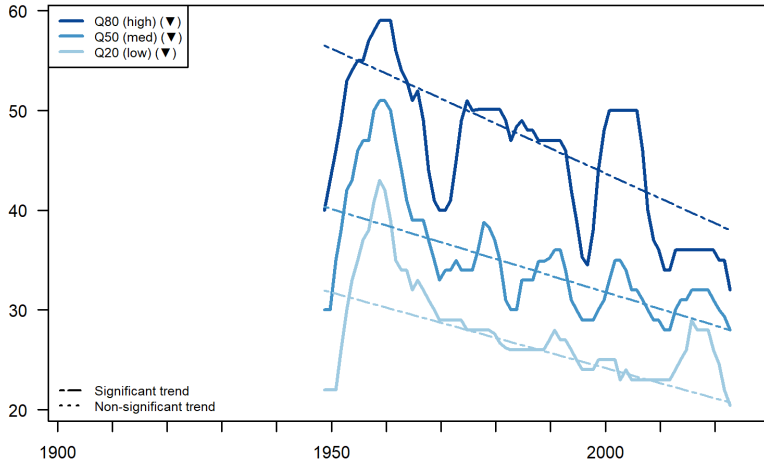


## Station #14052500

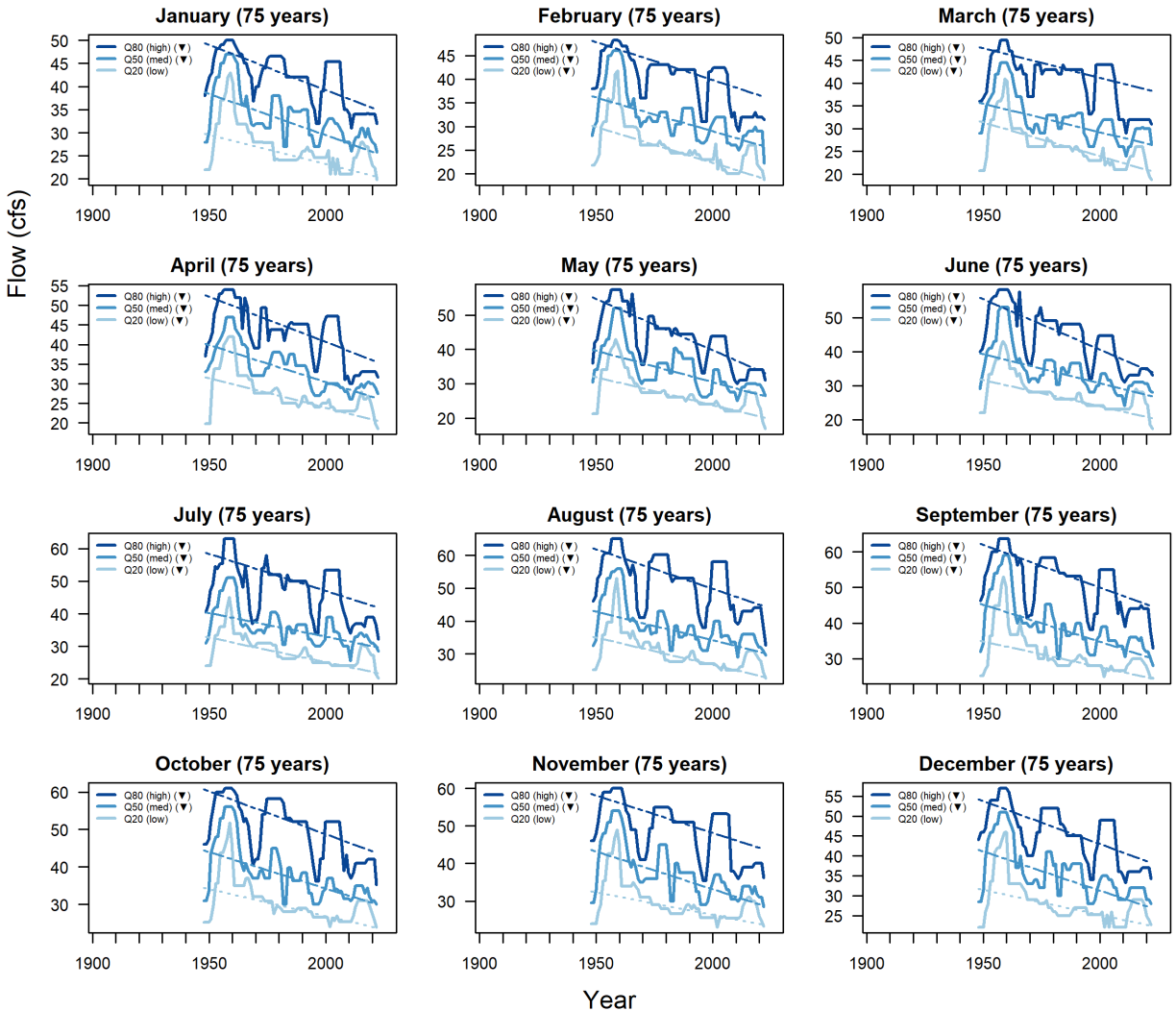
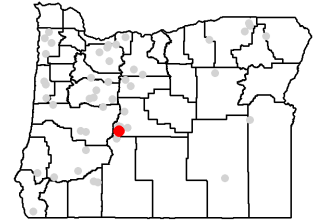


LT Flow Trends for Station #14054500

Annual Flow at Station #14054500 (75 years, 1948-2022)

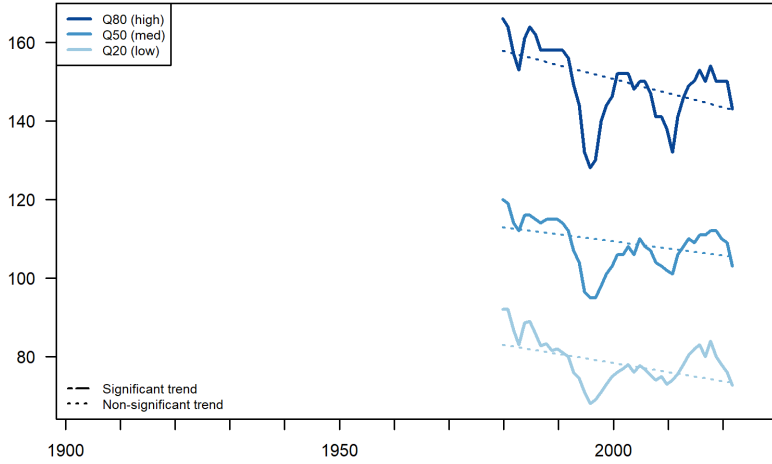


Station #14054500

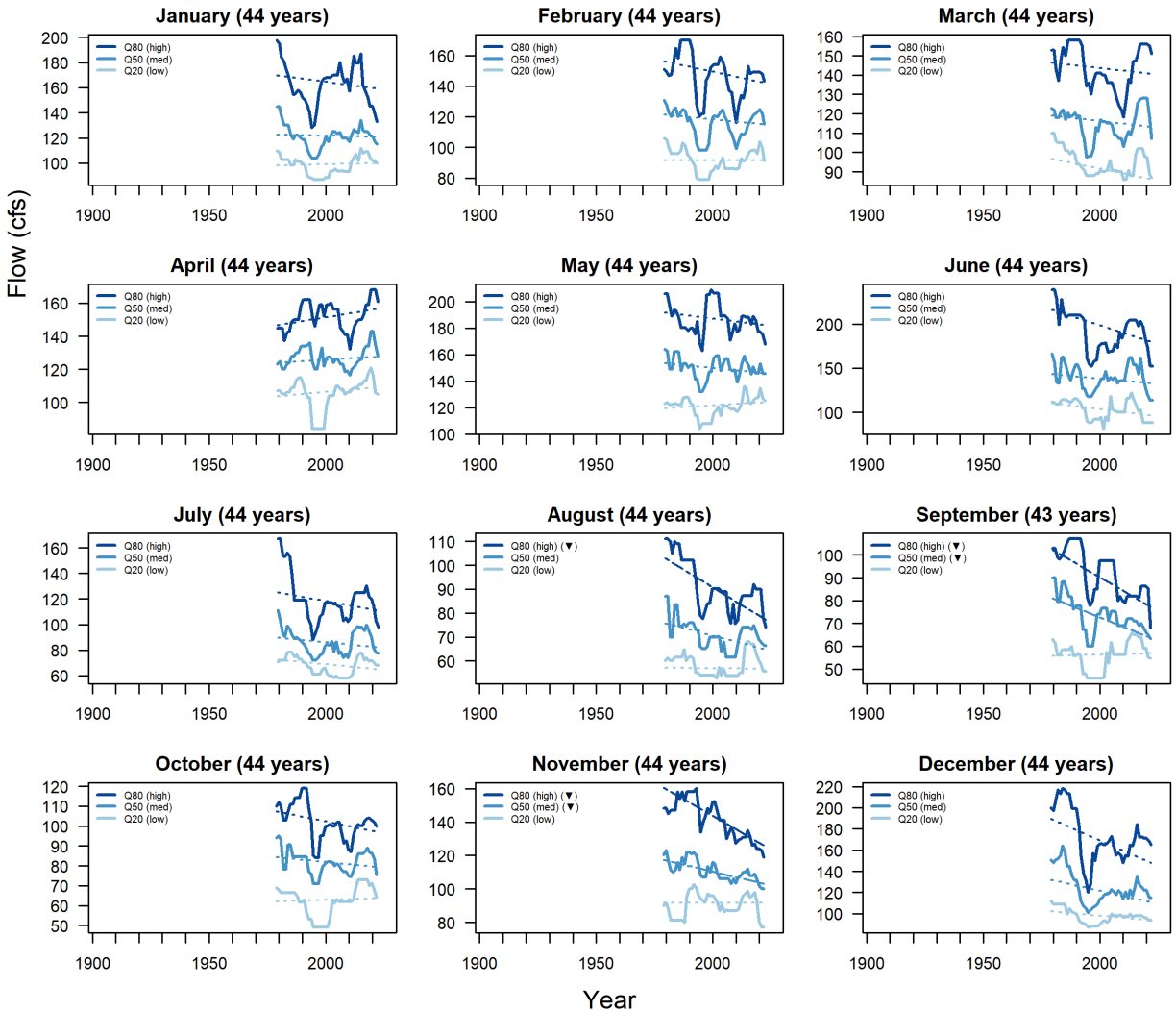
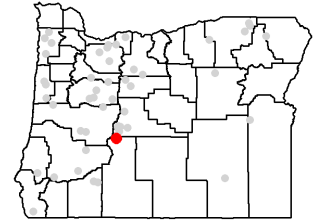


LT Flow Trends for Station #14055600

Annual Flow at Station #14055600 (43 years, 1979-2021)

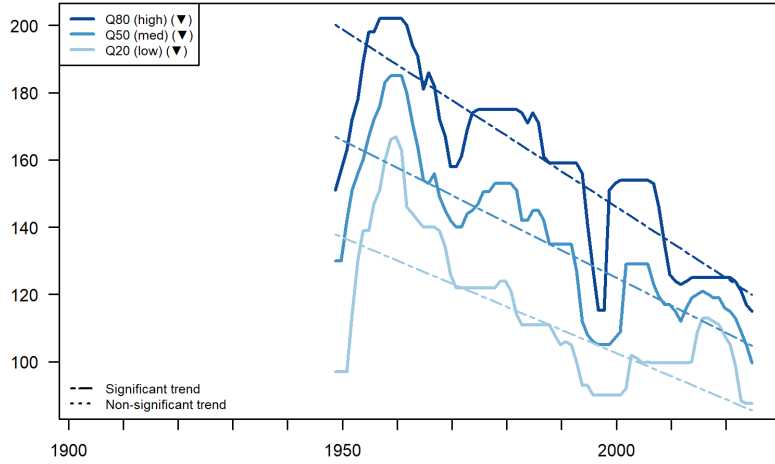


Station #14055600

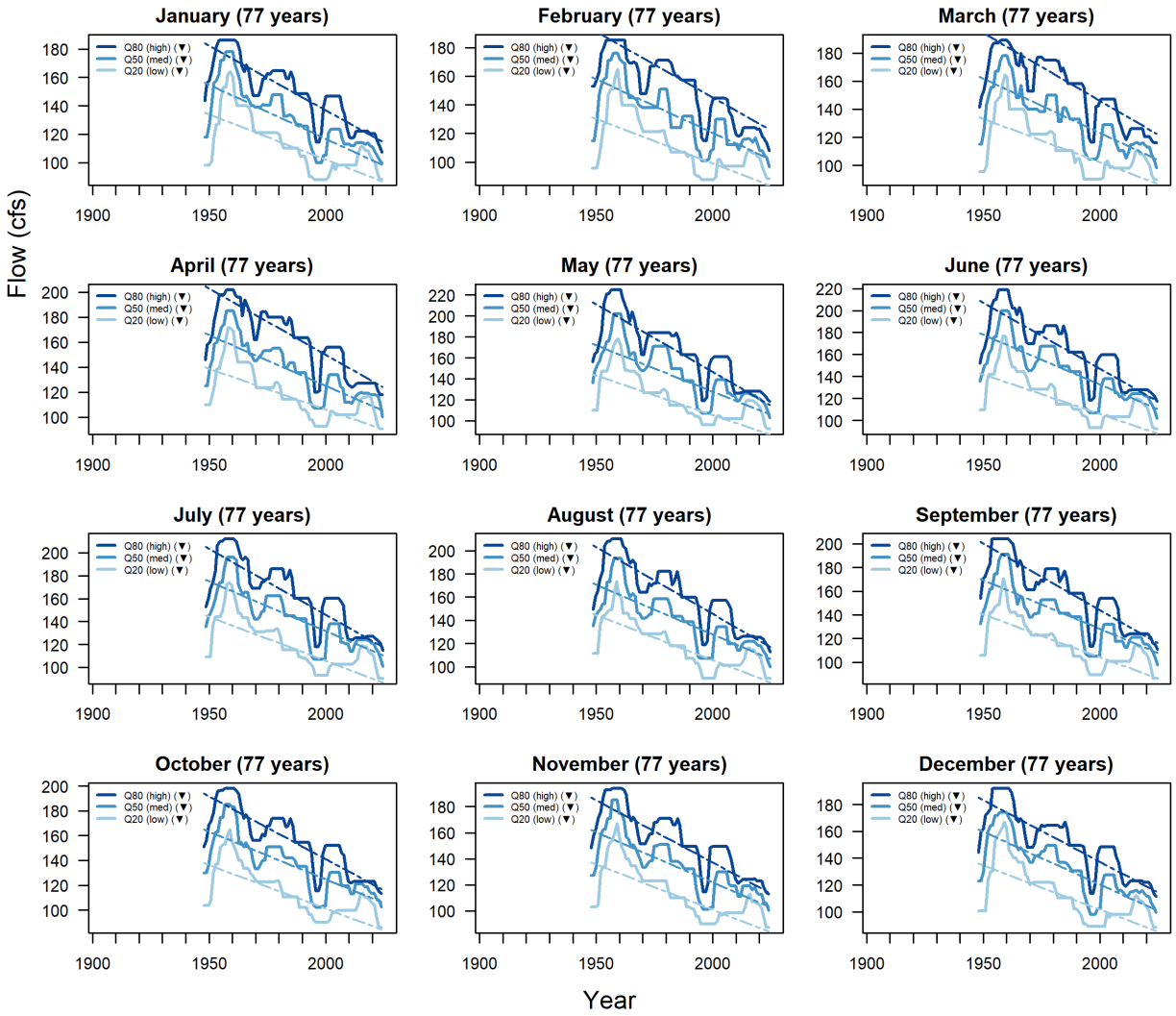
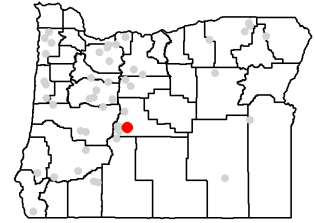


LT Flow Trends for Station #14057500

Annual Flow at Station #14057500 (77 years, 1948-2024)

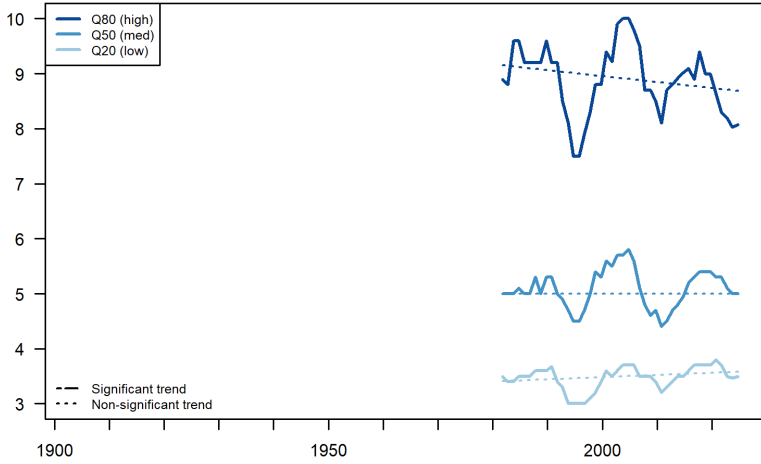


Station #14057500

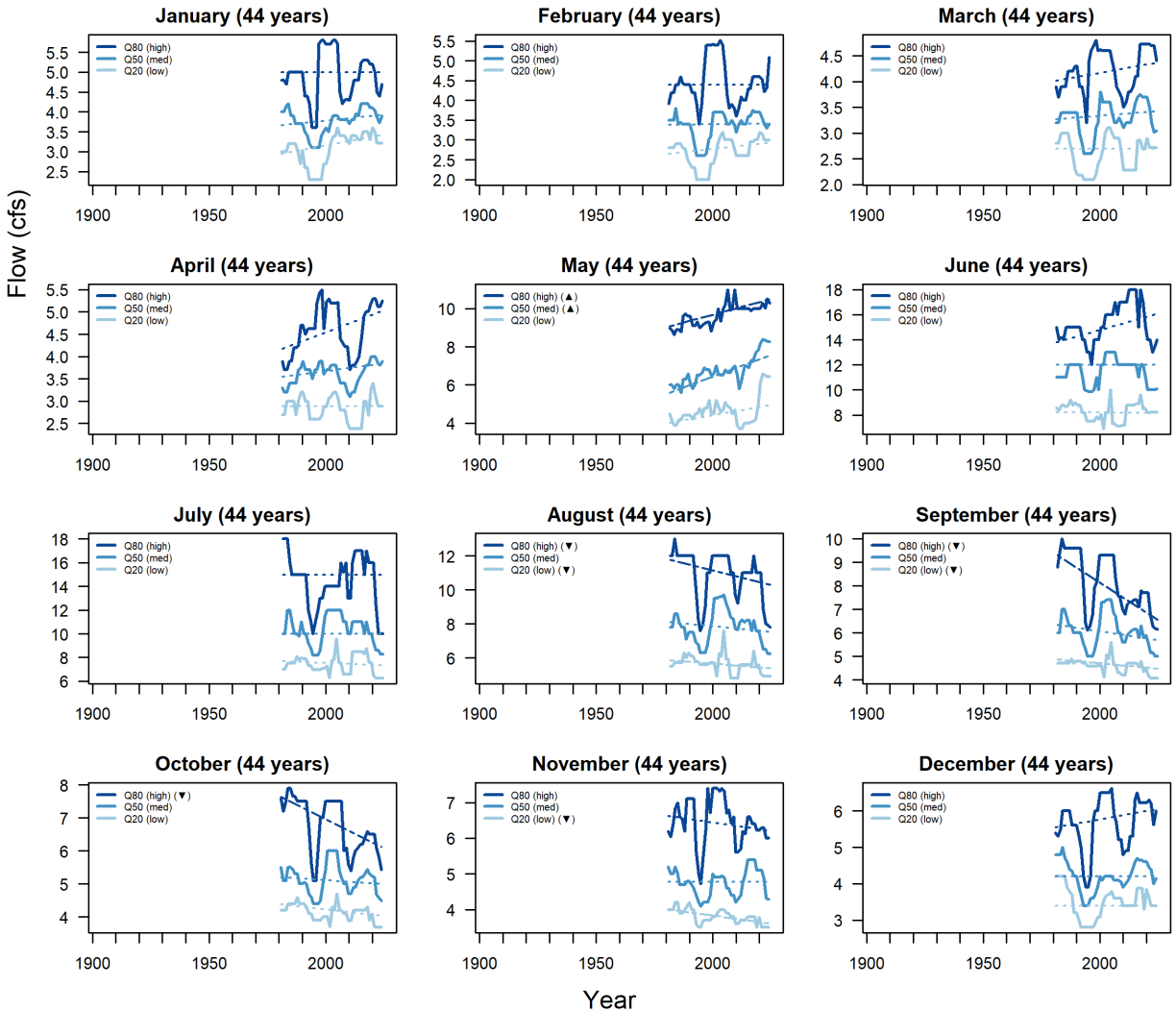
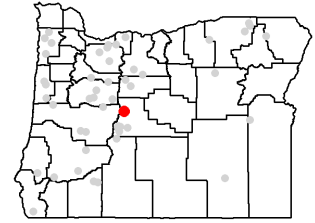


LT Flow Trends for Station #14074900

Annual Flow at Station #14074900 (44 years, 1981-2024)

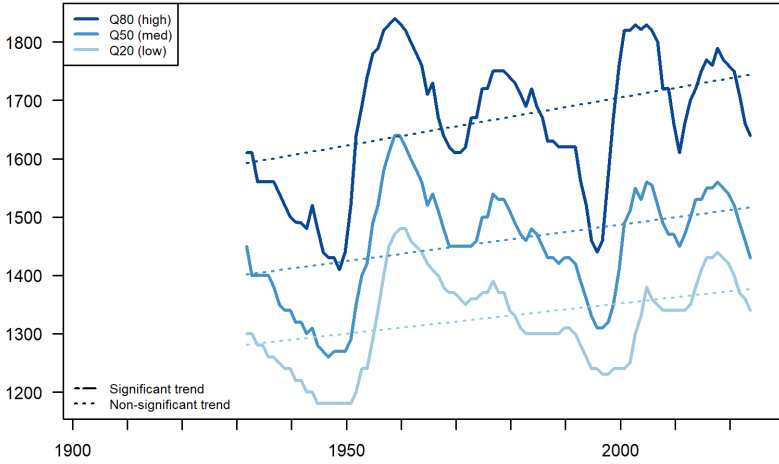


Station #14074900

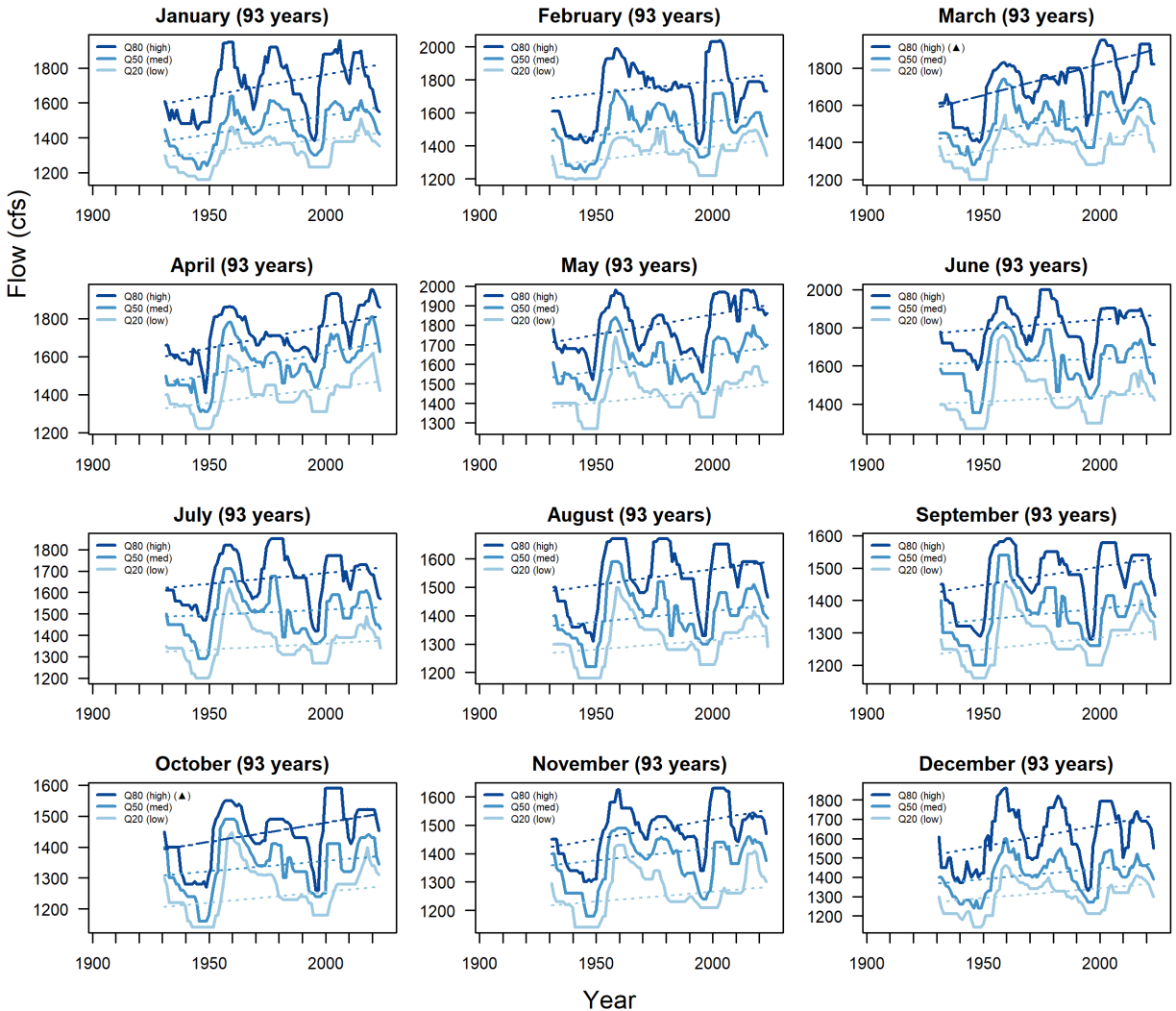
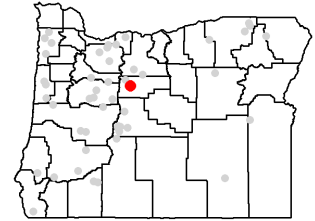


LT Flow Trends for Station #14091500

Annual Flow at Station #14091500 (93 years, 1931-2023)

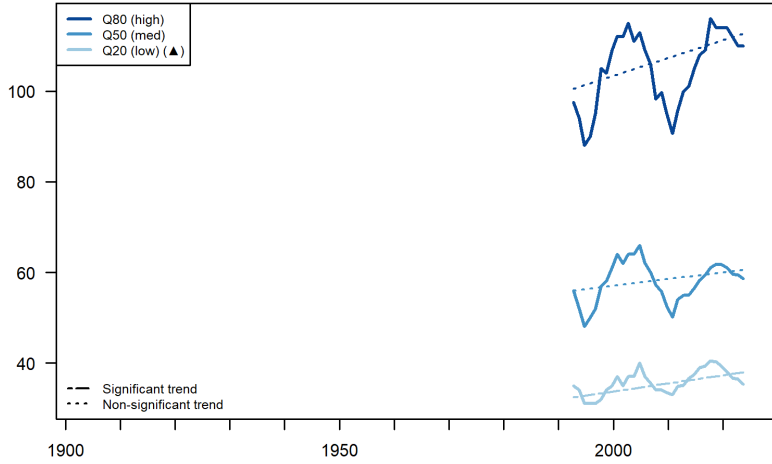


Station #14091500

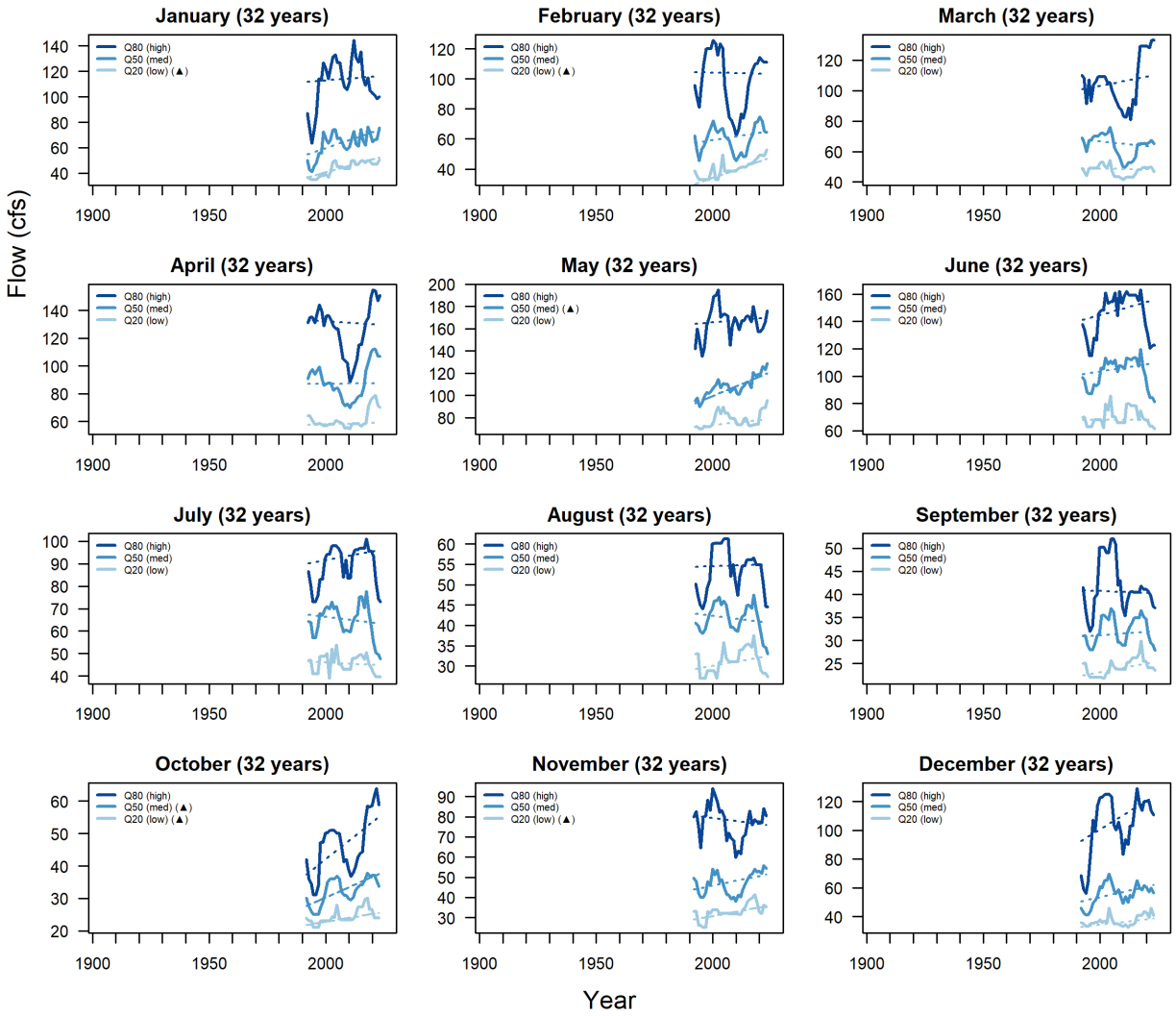
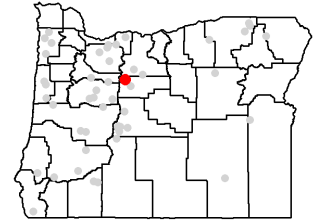


LT Flow Trends for Station #14092750

Annual Flow at Station #14092750 (32 years, 1992-2023)

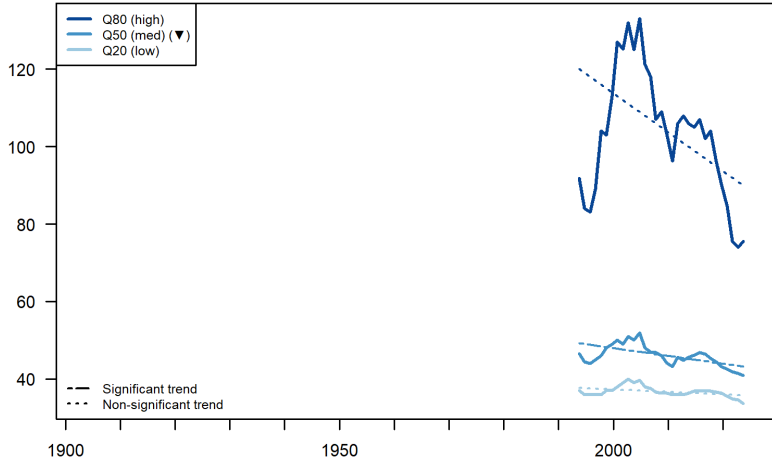


Station #14092750

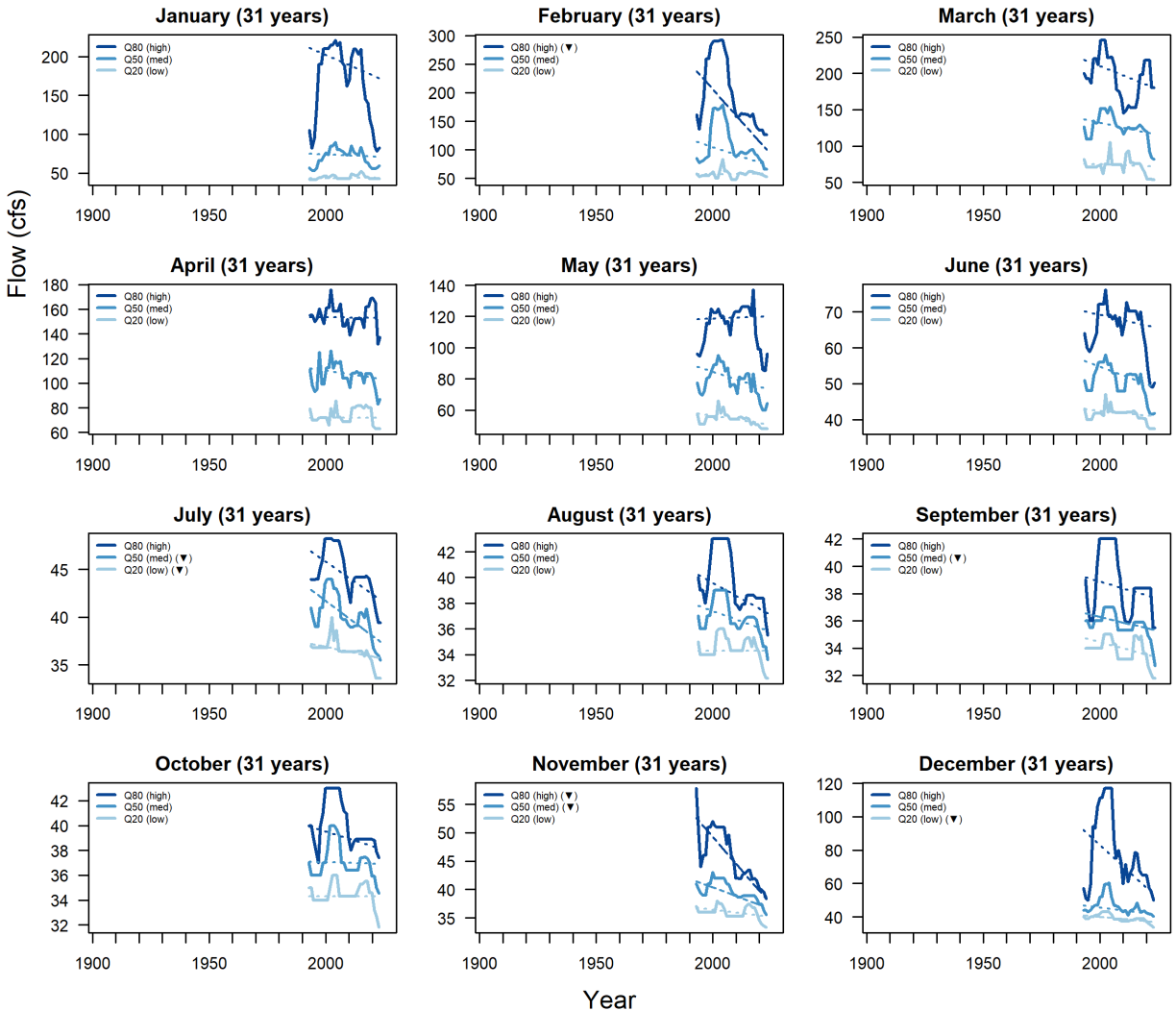
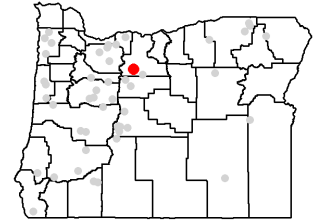


LT Flow Trends for Station #14096850

Annual Flow at Station #14096850 (31 years, 1993-2023)

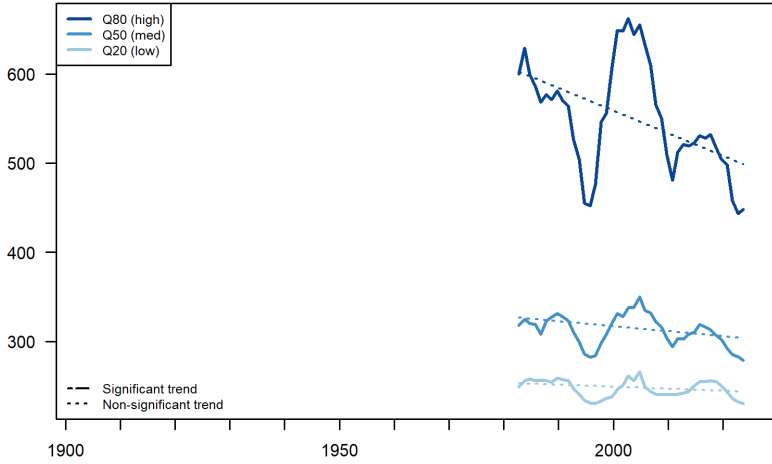


Station #14096850

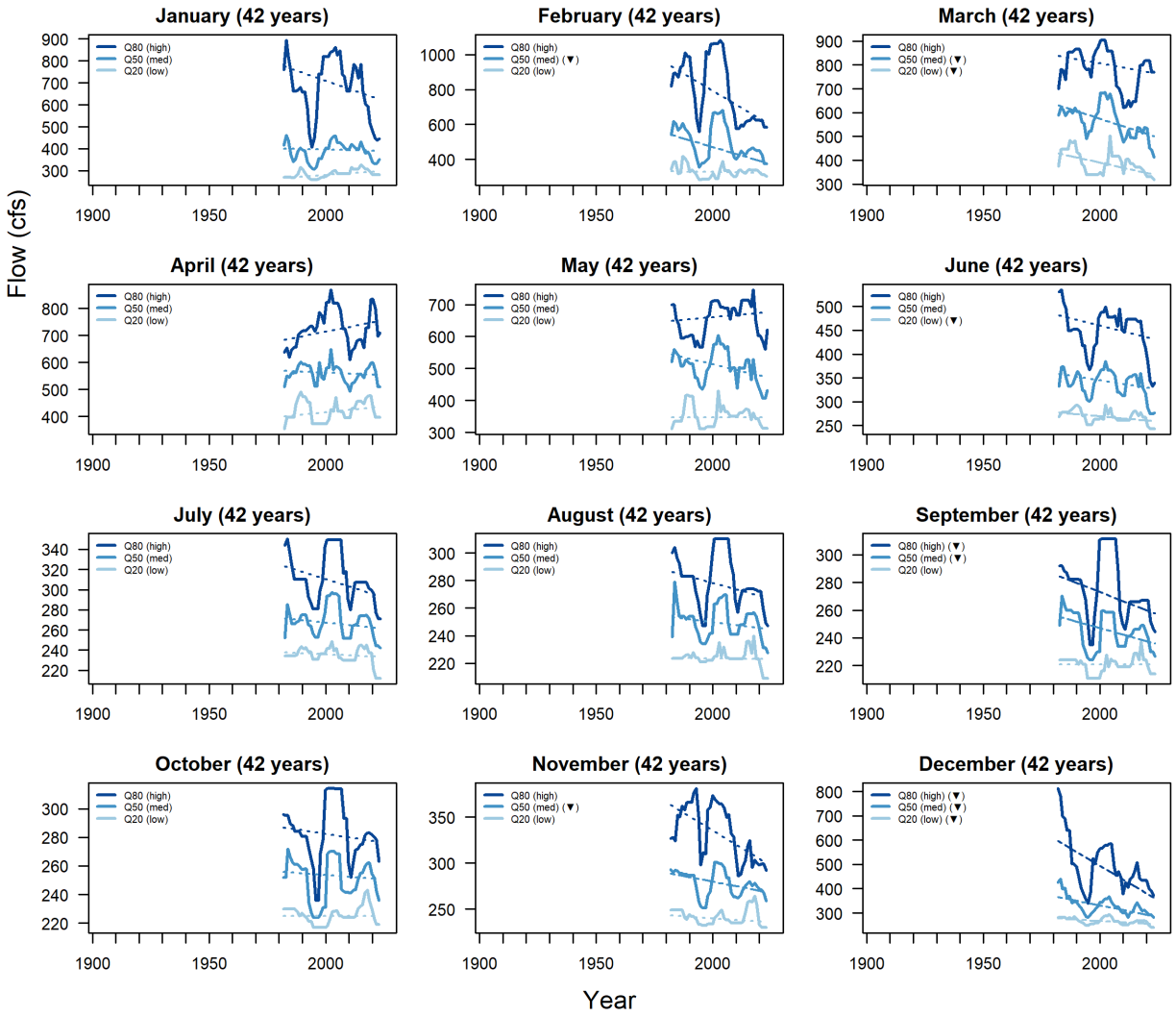
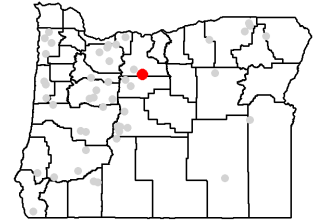


LT Flow Trends for Station #14097100

Annual Flow at Station #14097100 (42 years, 1982-2023)

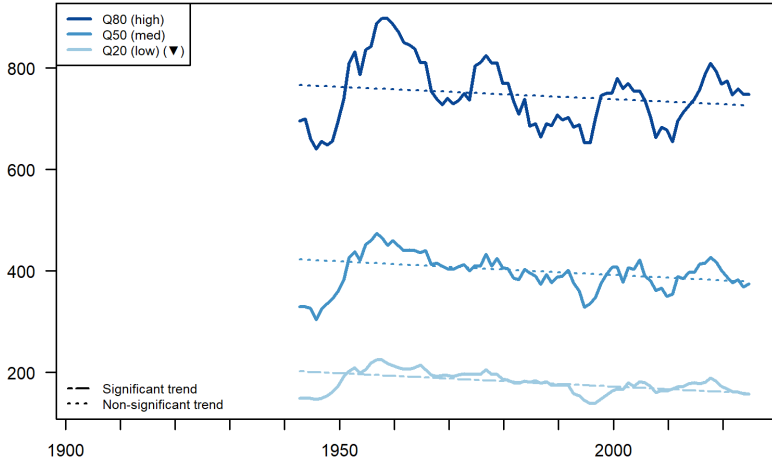


Station #14097100

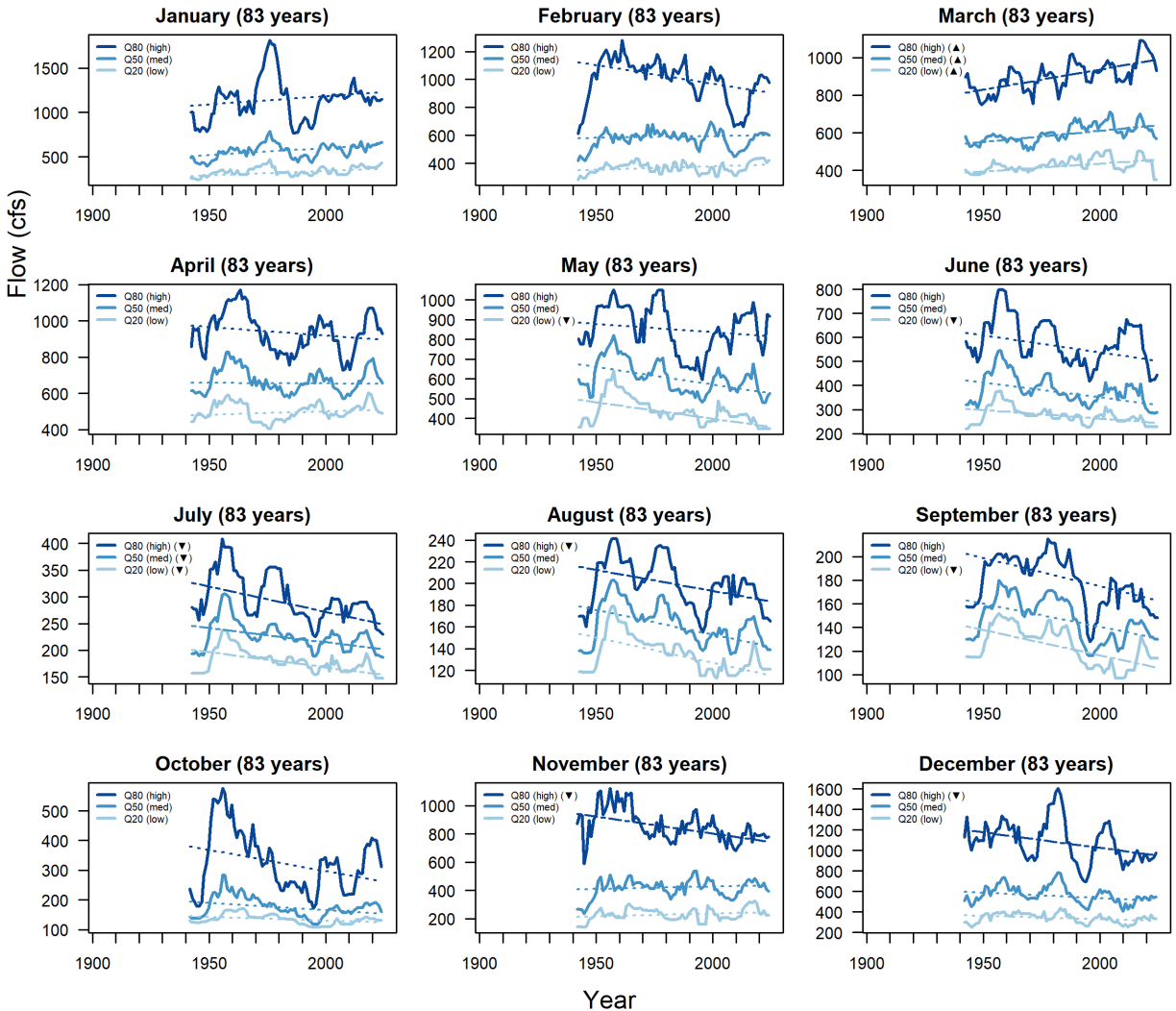
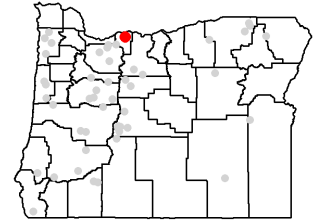


LT Flow Trends for Station #14118500

Annual Flow at Station #14118500 (83 years, 1942-2024)

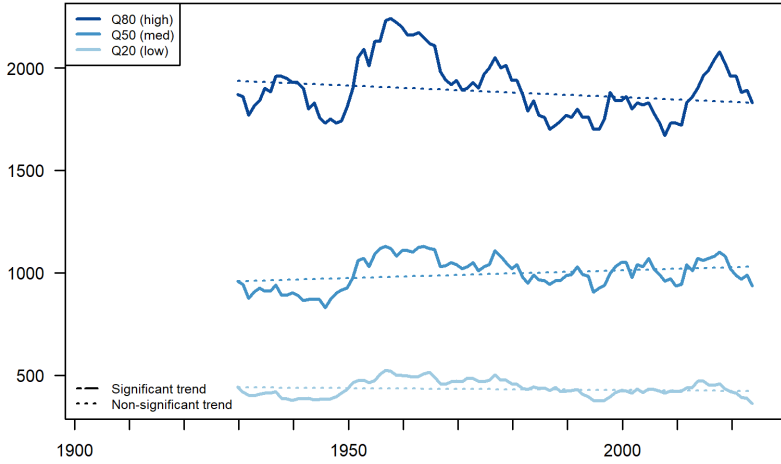


Station #14118500

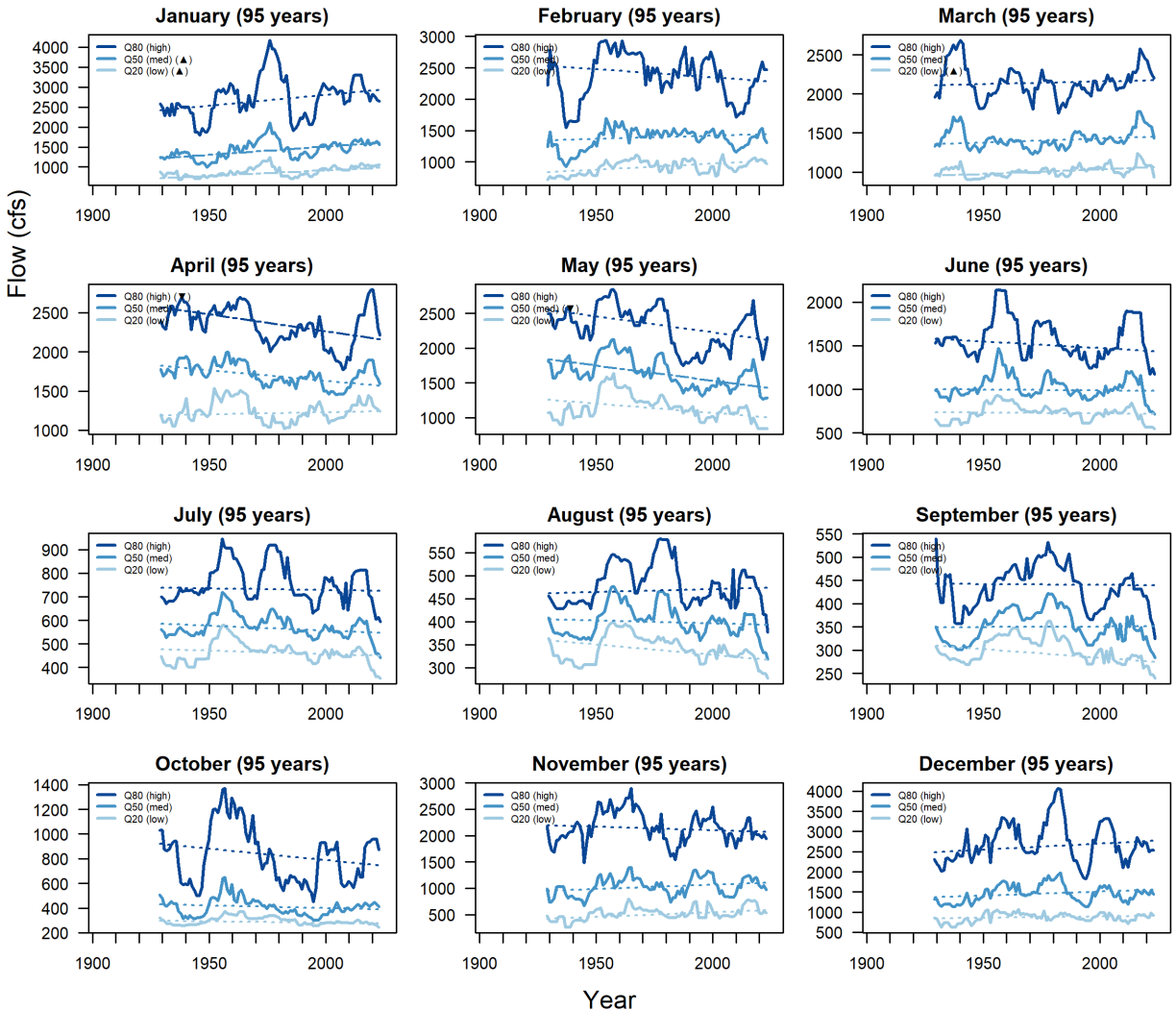
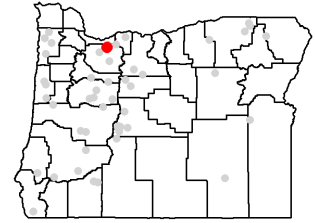


LT Flow Trends for Station #14137000

Annual Flow at Station #14137000 (95 years, 1929-2023)

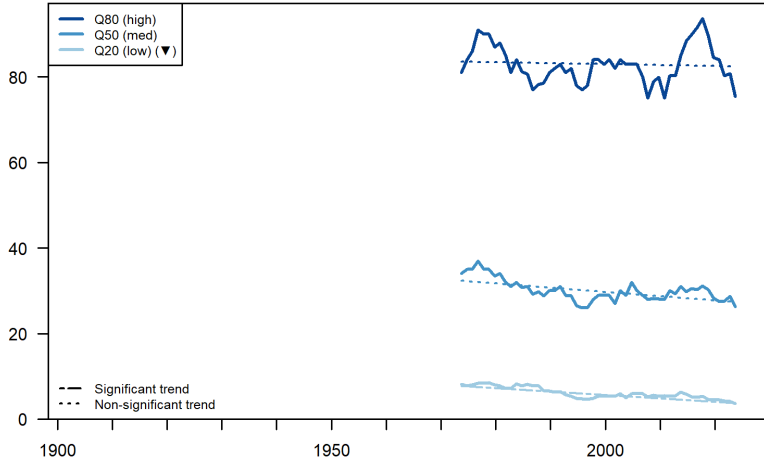


Station #14137000

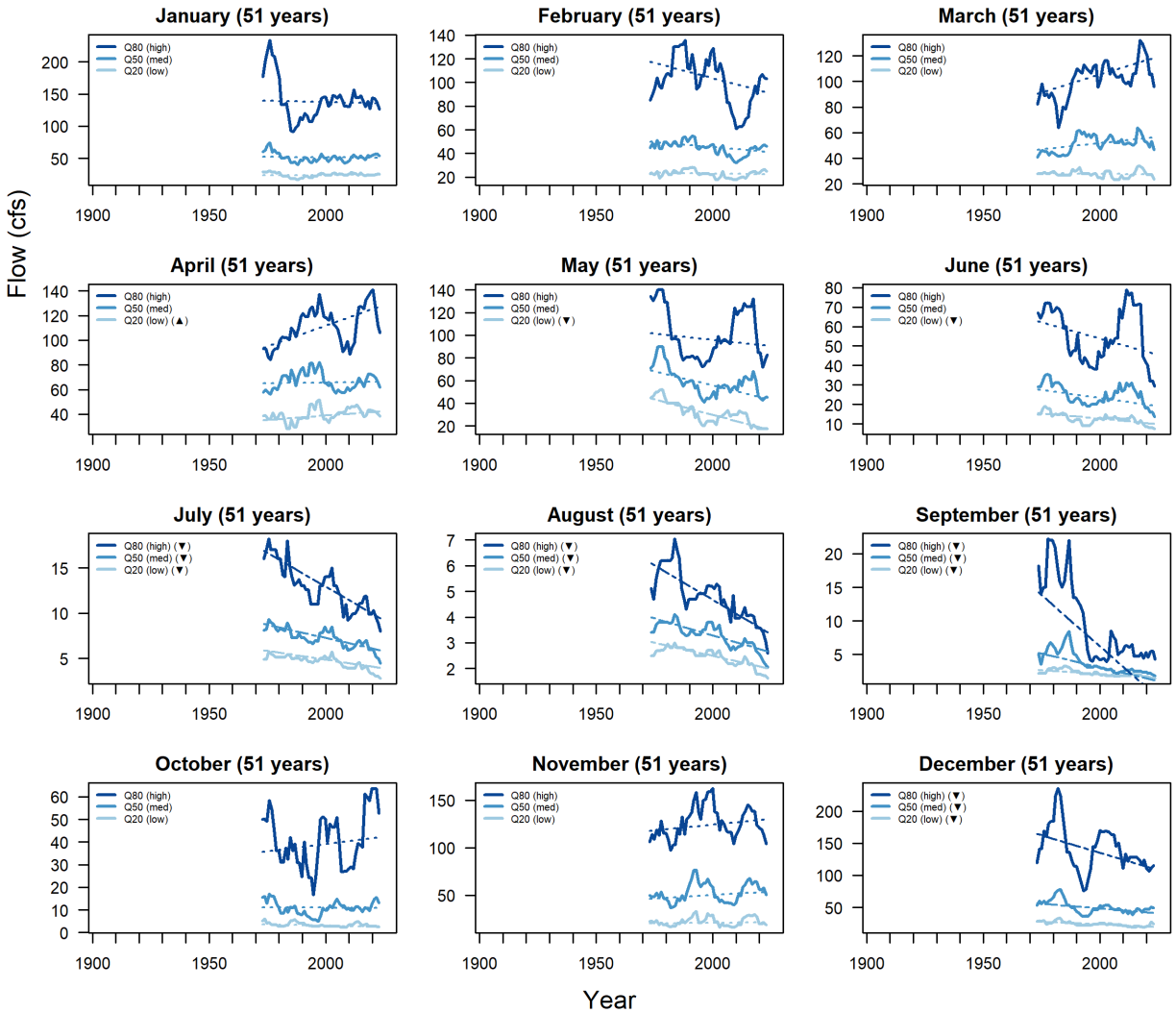
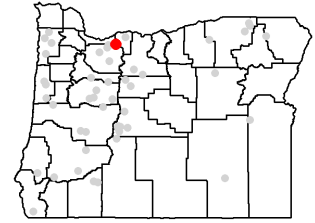


LT Flow Trends for Station #14138800

Annual Flow at Station #14138800 (51 years, 1973-2023)

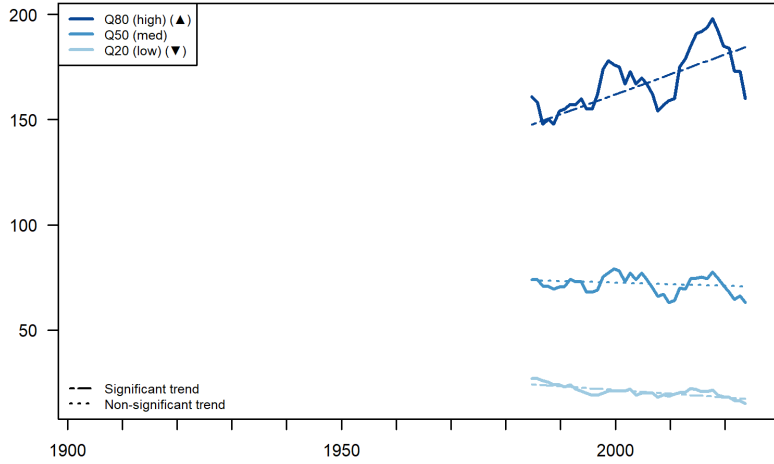


Station #14138800

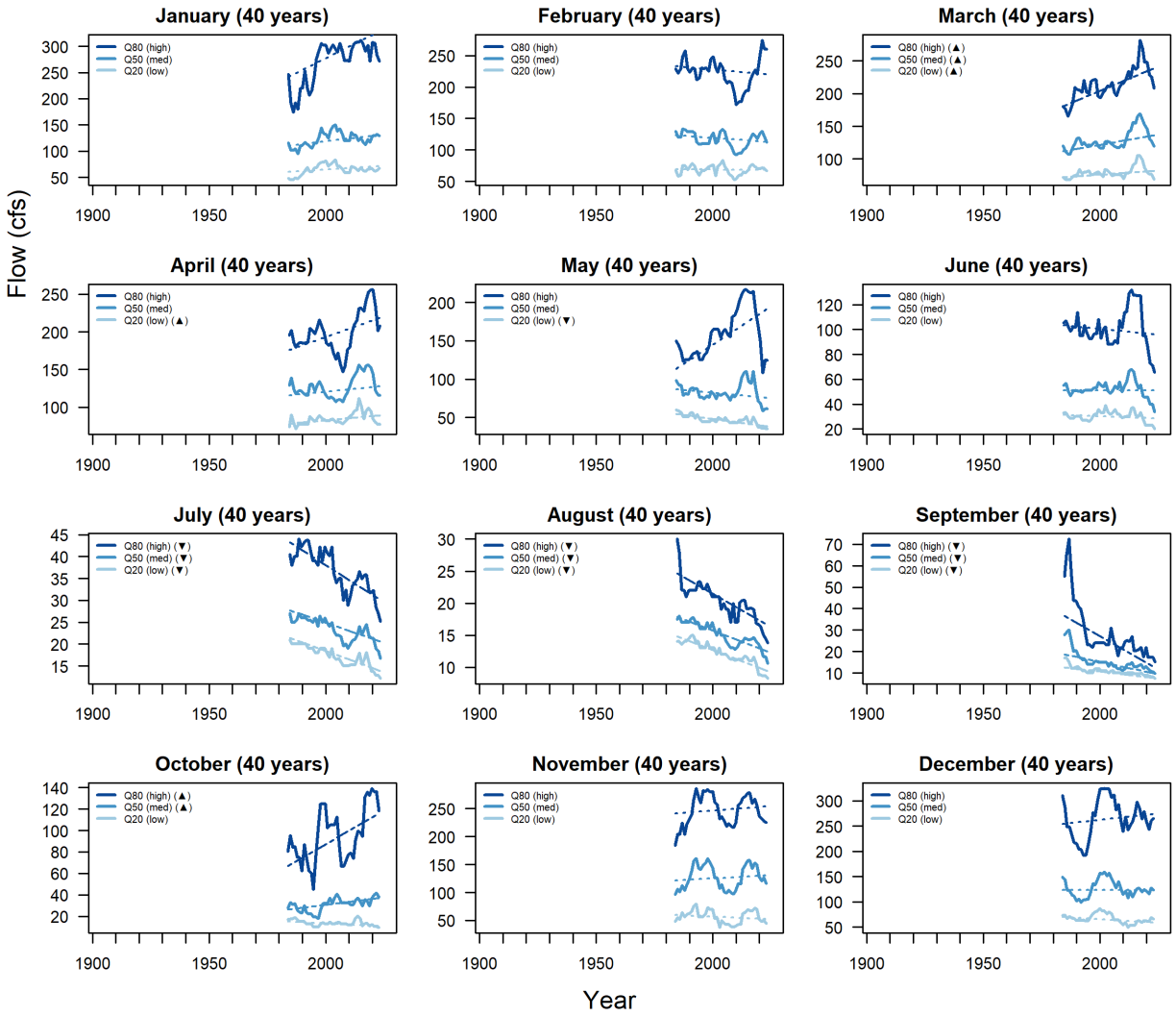
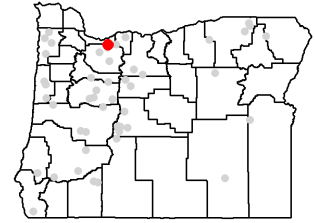


LT Flow Trends for Station #14139800

Annual Flow at Station #14139800 (40 years, 1984-2023)

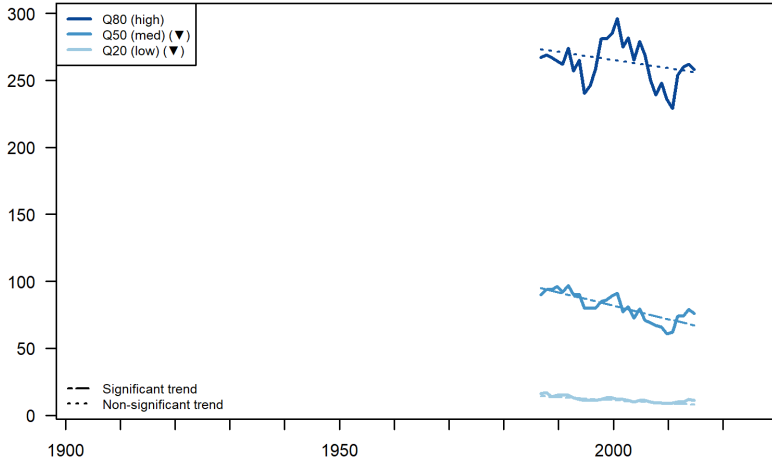


Station #14139800

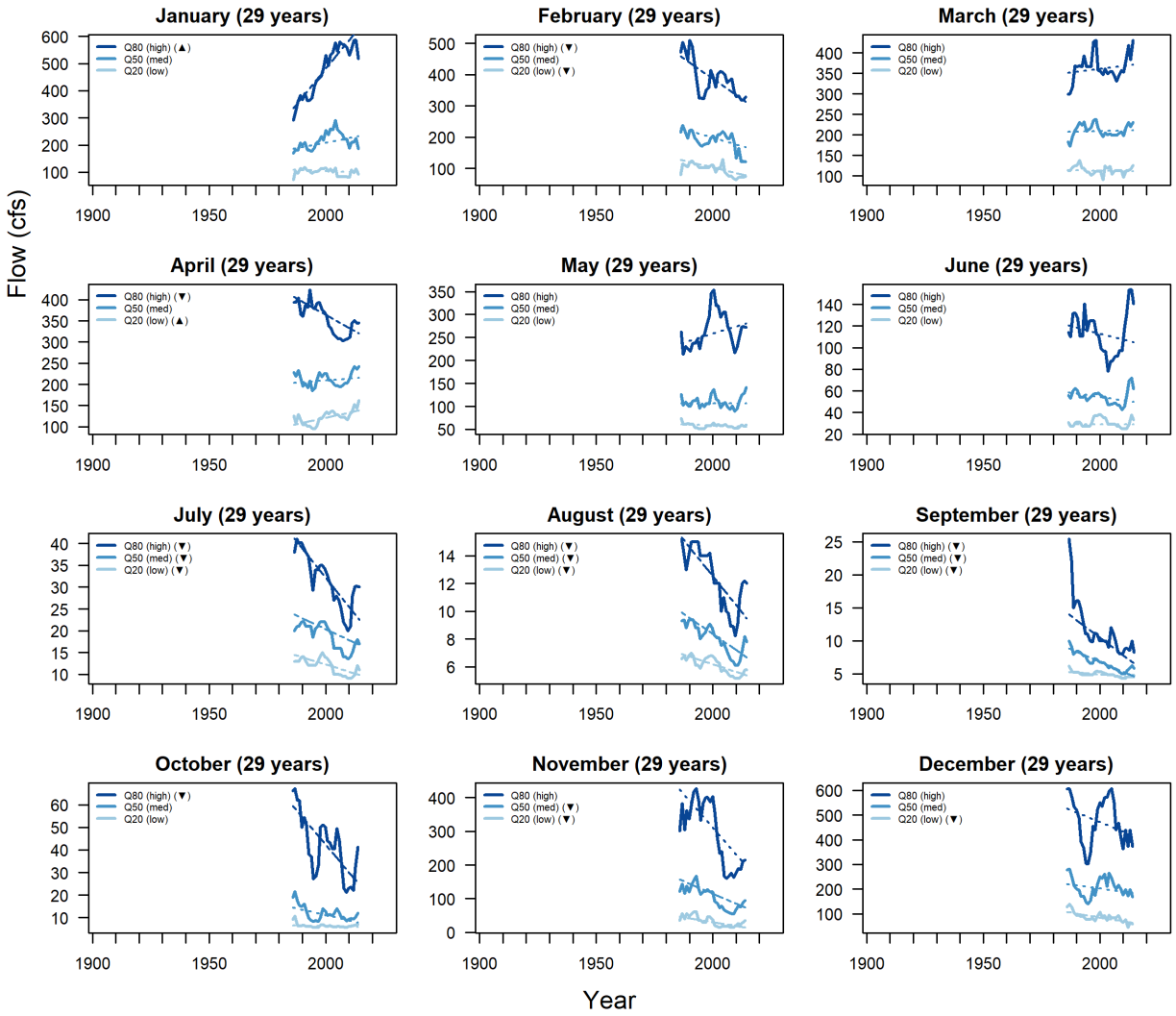
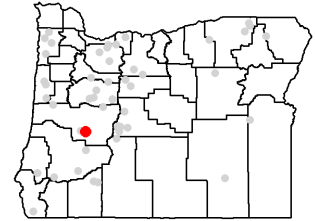


LT Flow Trends for Station #14153800

Annual Flow at Station #14153800 (29 years, 1986-2014)

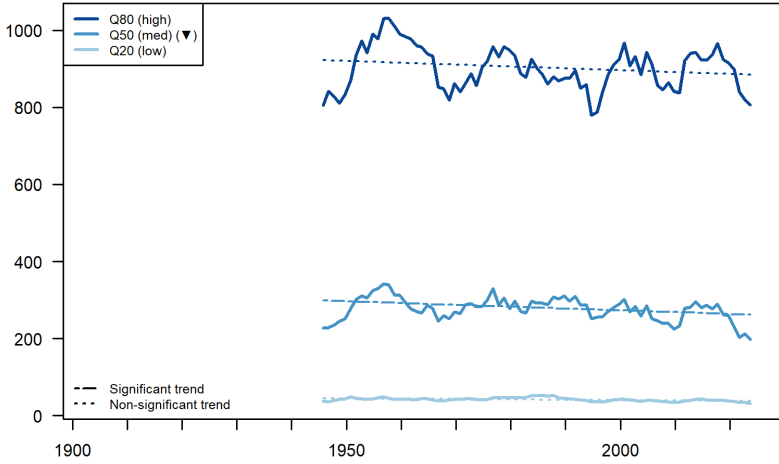


Station #14153800

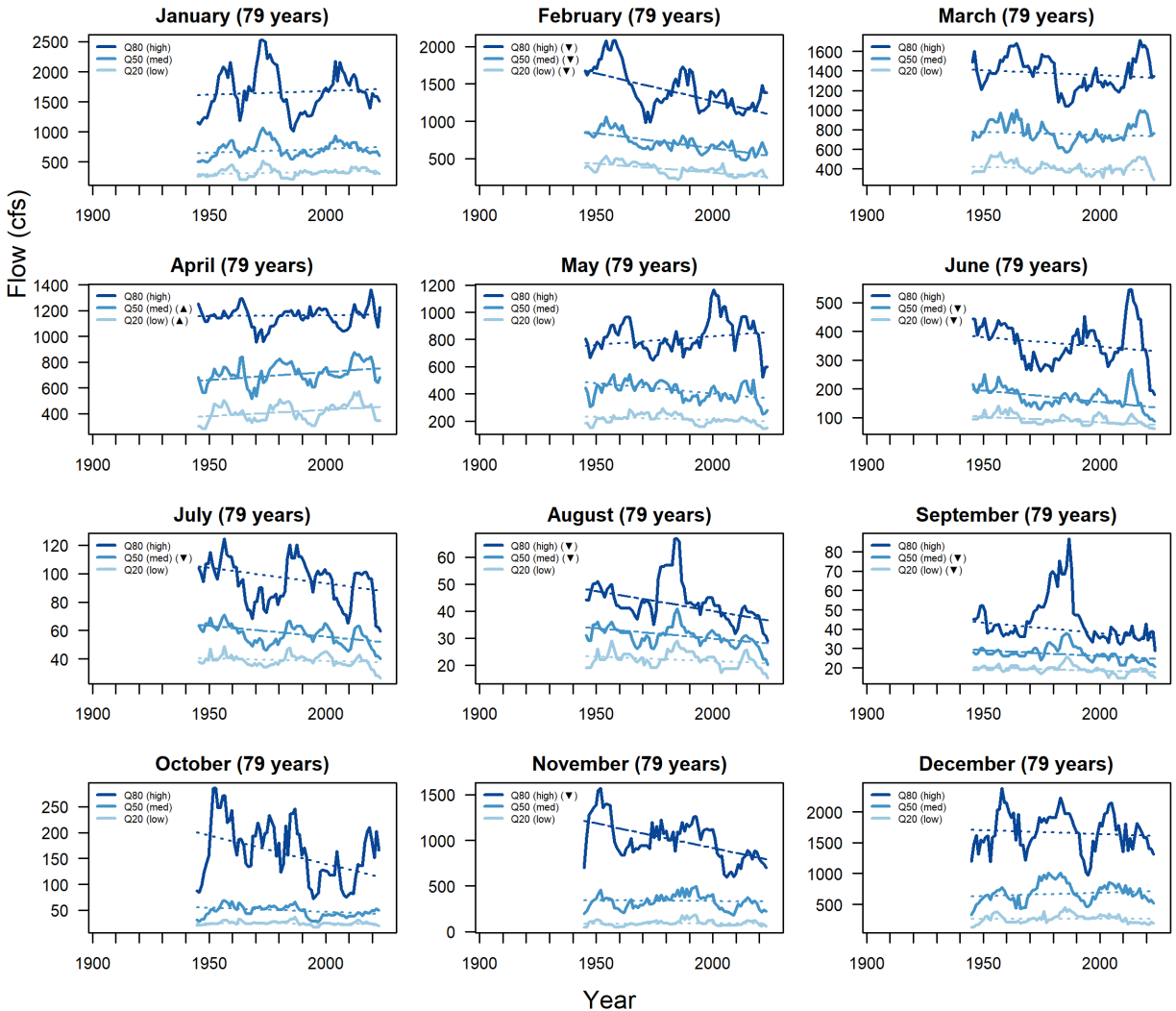
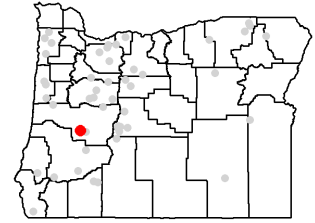


LT Flow Trends for Station #14154500

Annual Flow at Station #14154500 (79 years, 1945-2023)

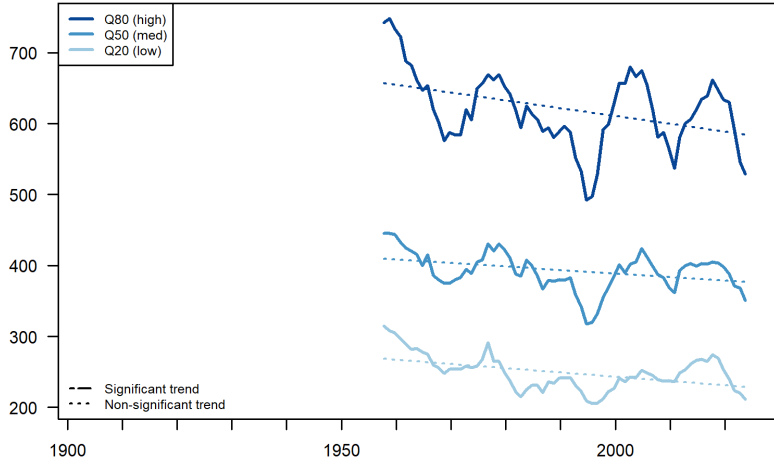


Station #14154500

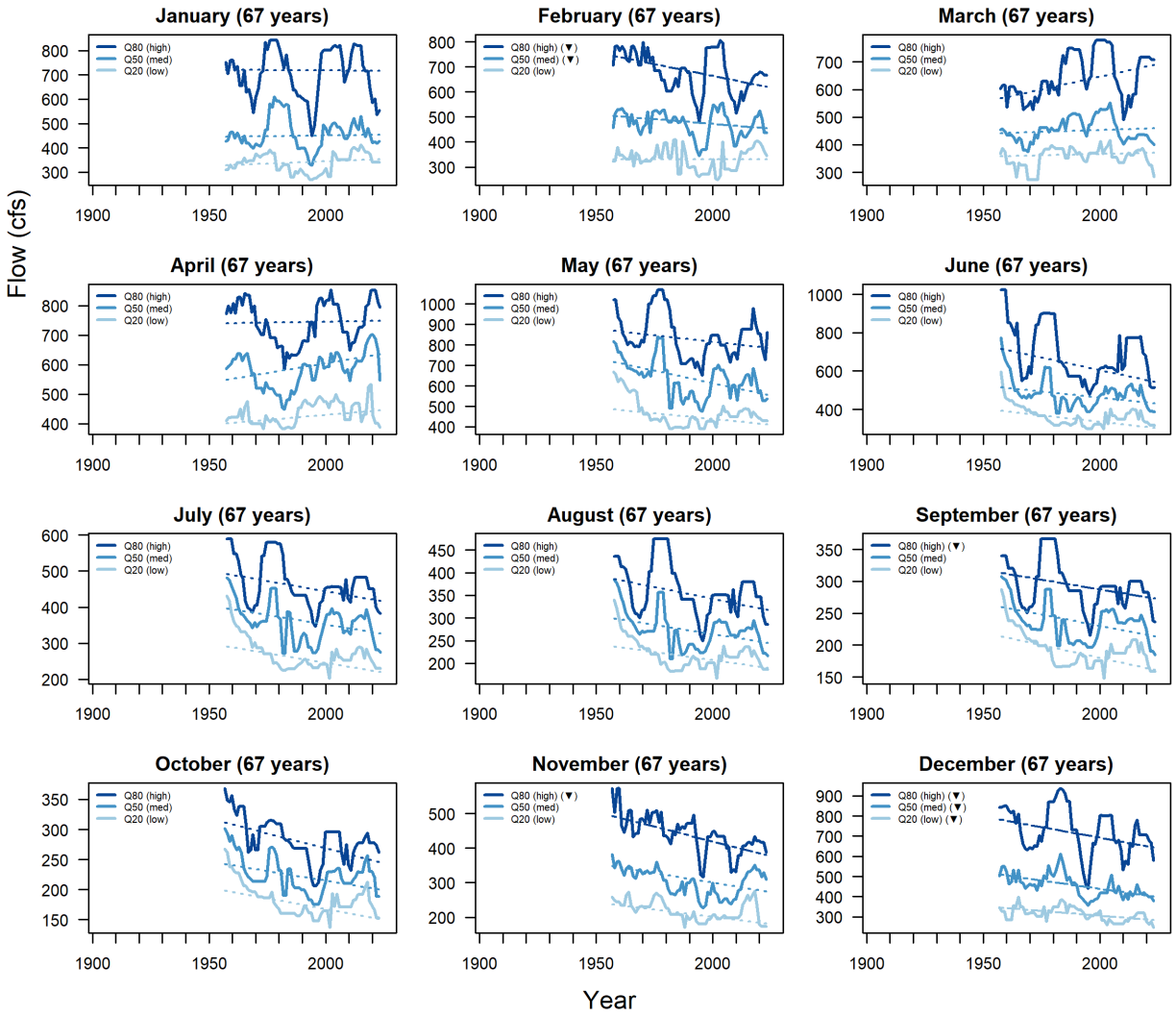
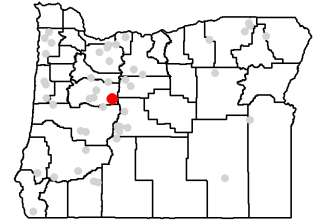


LT Flow Trends for Station #14158500

Annual Flow at Station #14158500 (67 years, 1957-2023)

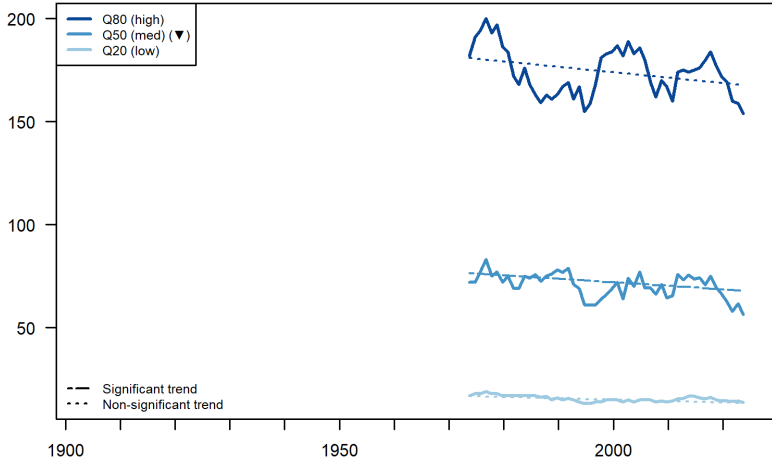


Station #14158500

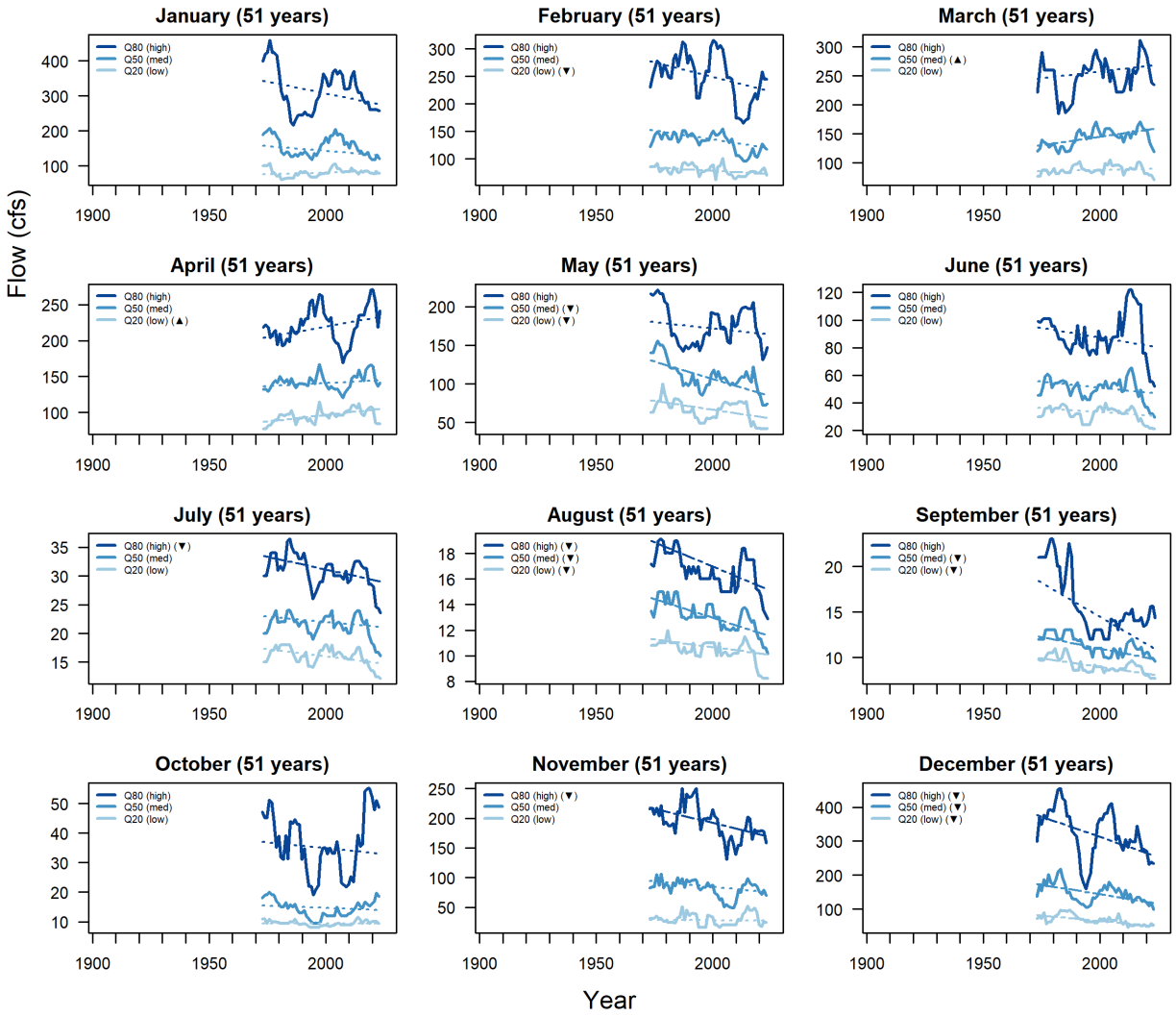
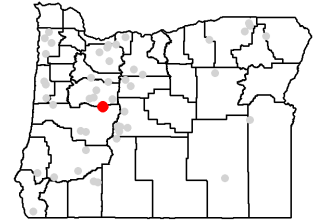


LT Flow Trends for Station #14161500

Annual Flow at Station #14161500 (51 years, 1973-2023)

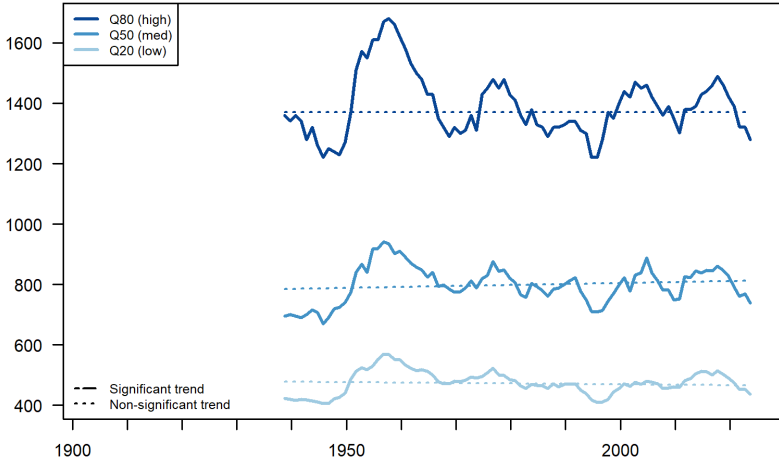


Station #14161500

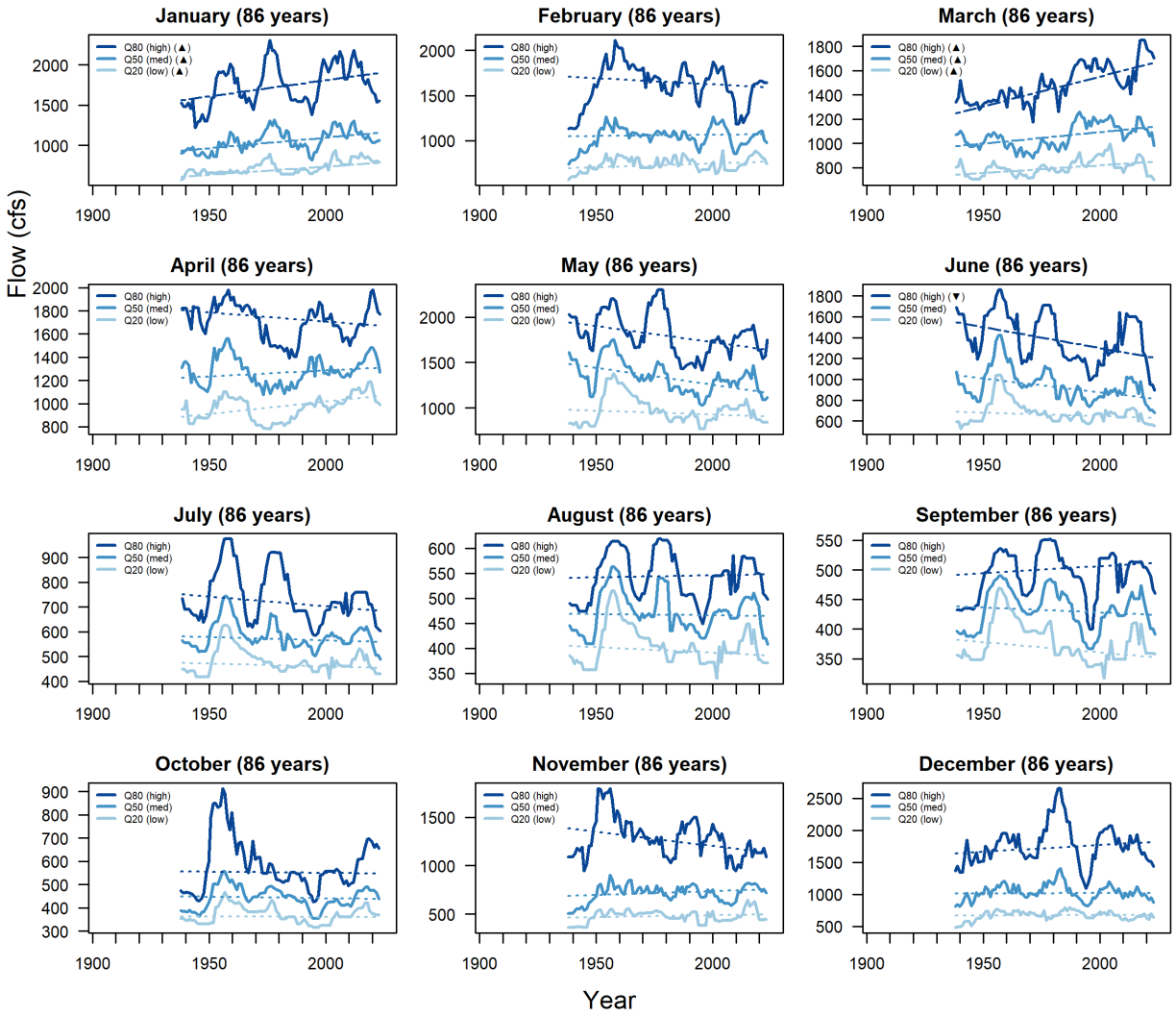
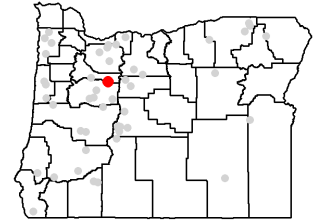


LT Flow Trends for Station #14178000

Annual Flow at Station #14178000 (86 years, 1938-2023)

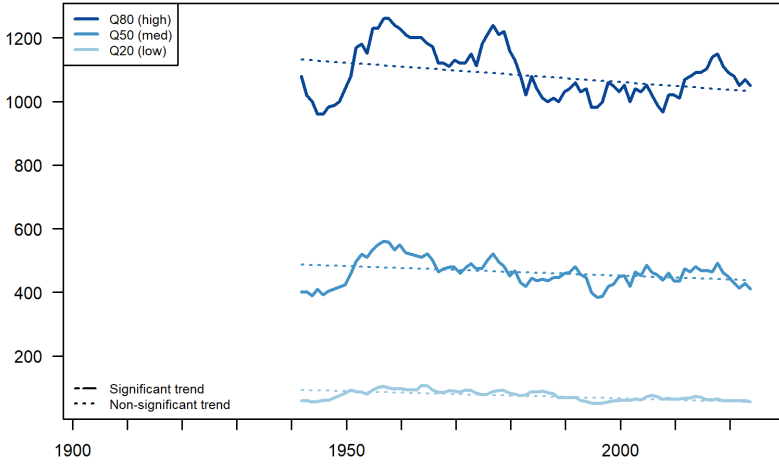


Station #14178000

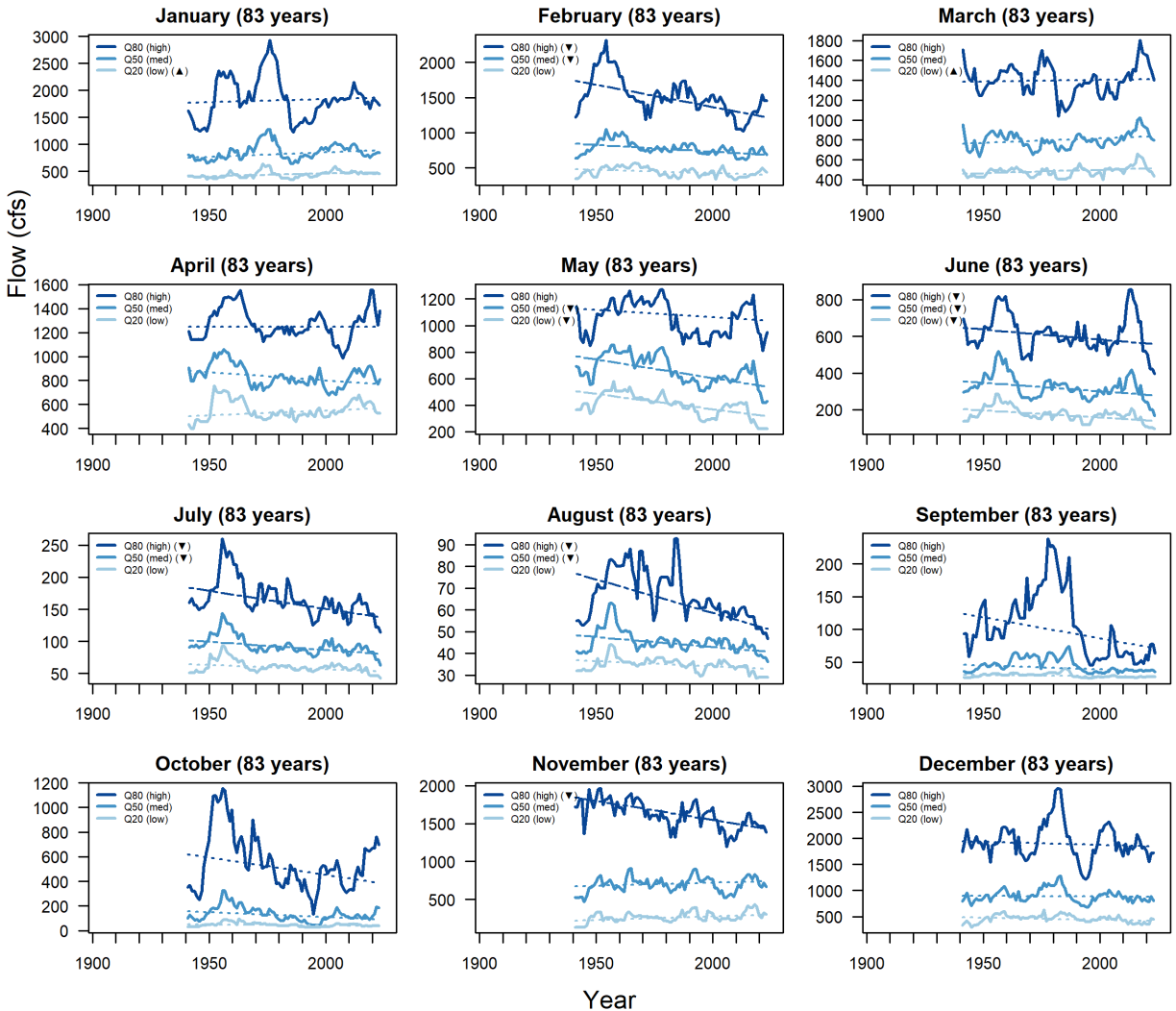
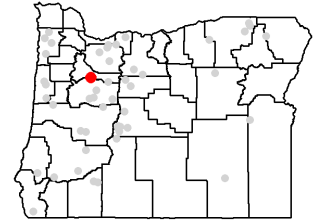


# LT Flow Trends for Station #14182500

## Annual Flow at Station #14182500 (83 years, 1941-2023)

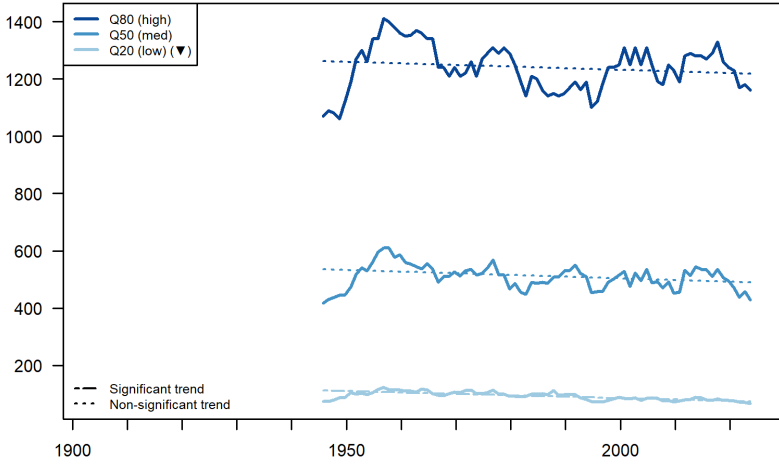


## Station #14182500

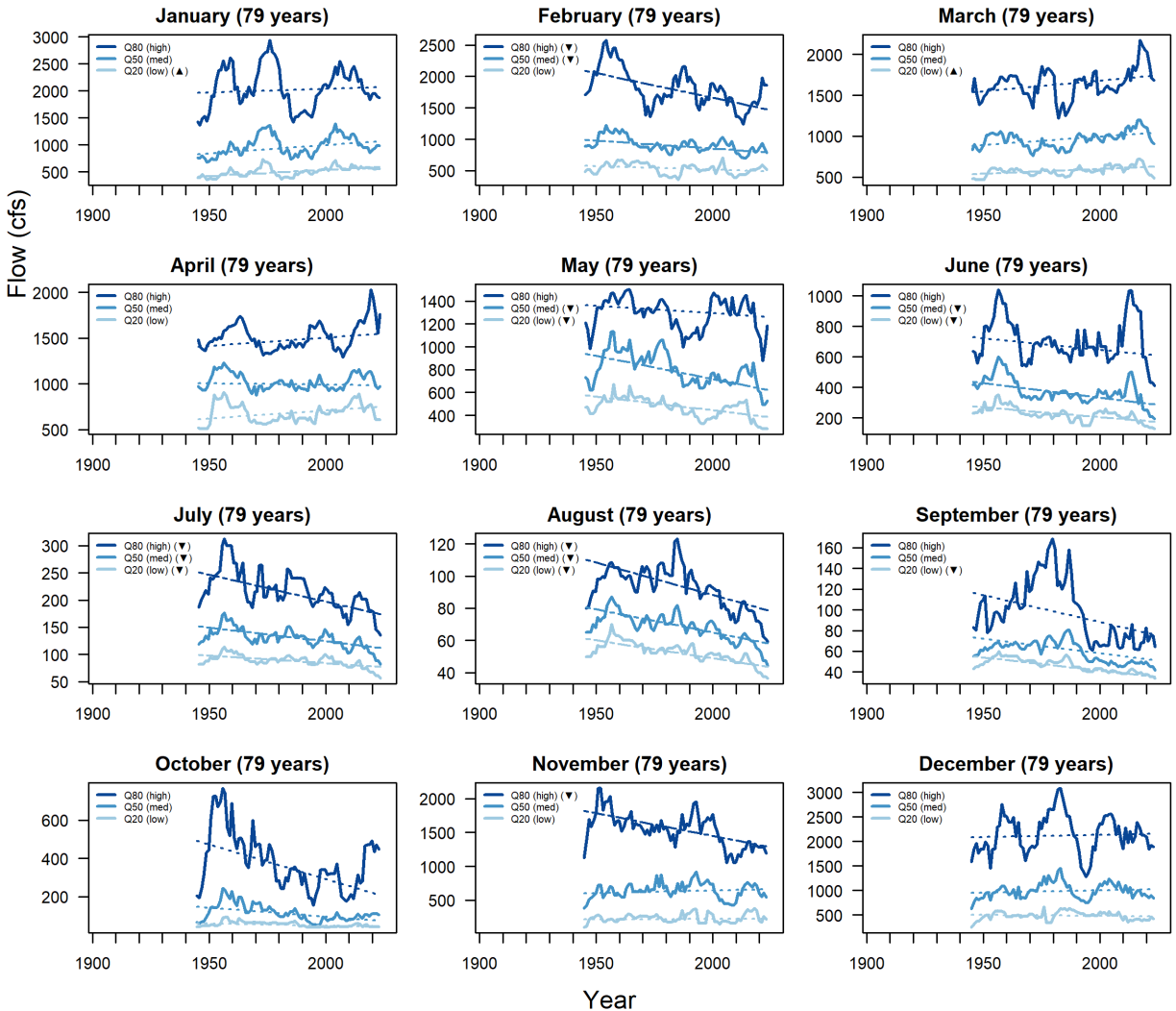
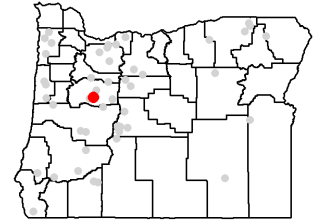


LT Flow Trends for Station #14185000

Annual Flow at Station #14185000 (79 years, 1945-2023)

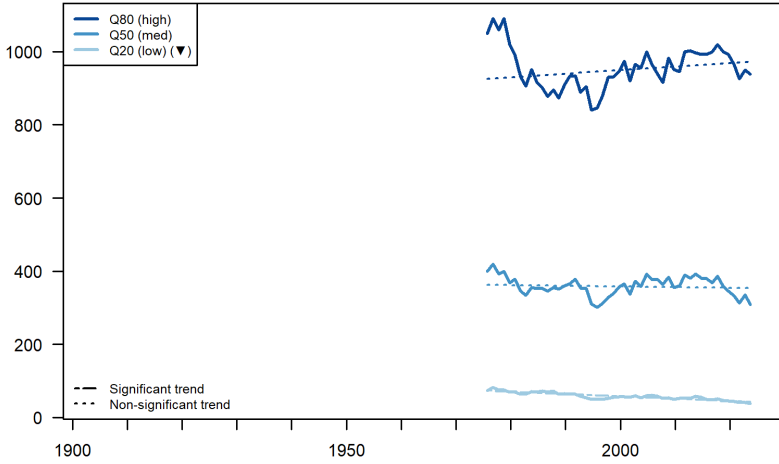


Station #14185000

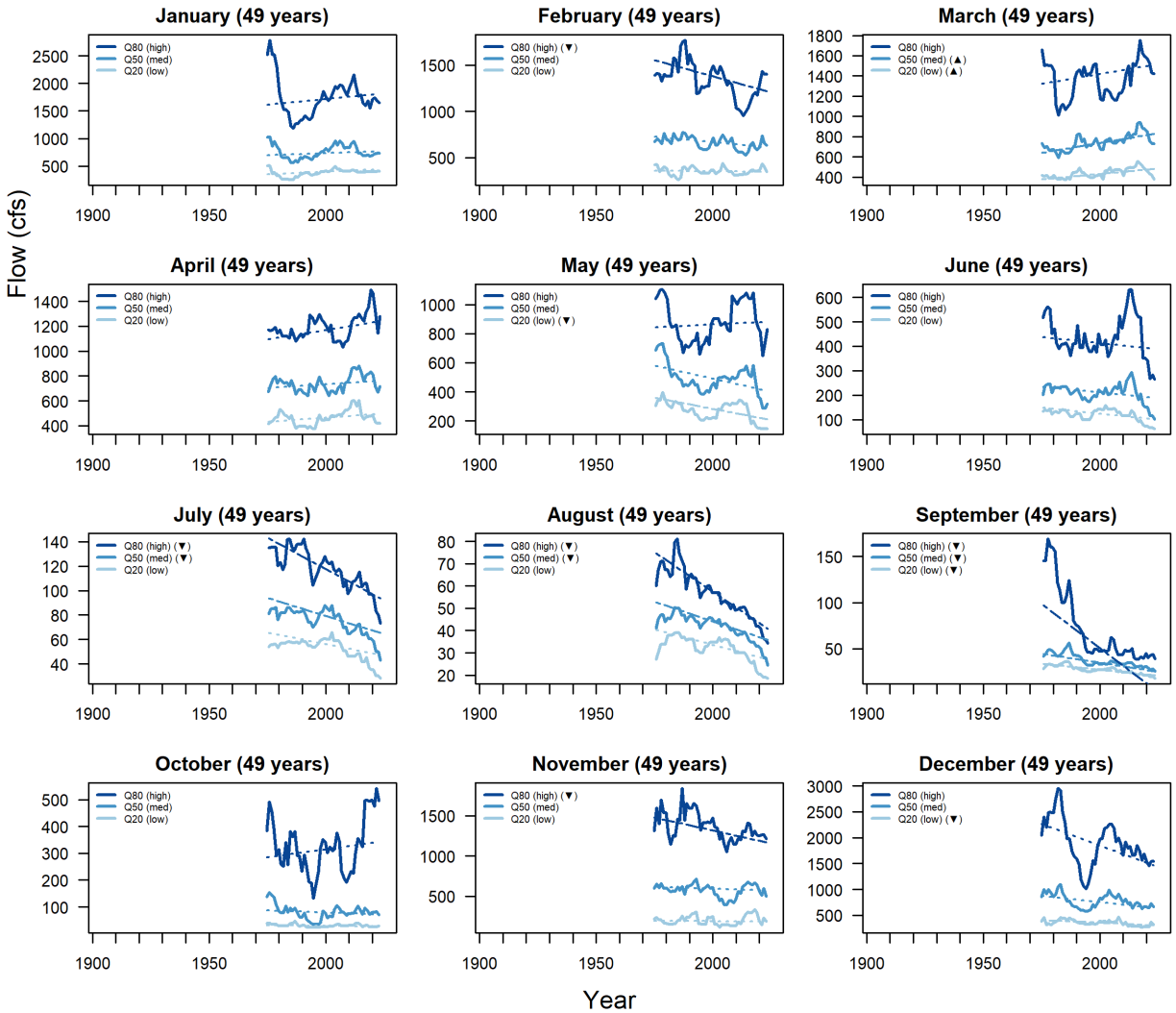
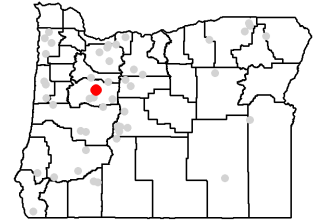


LT Flow Trends for Station #14185900

Annual Flow at Station #14185900 (49 years, 1975-2023)

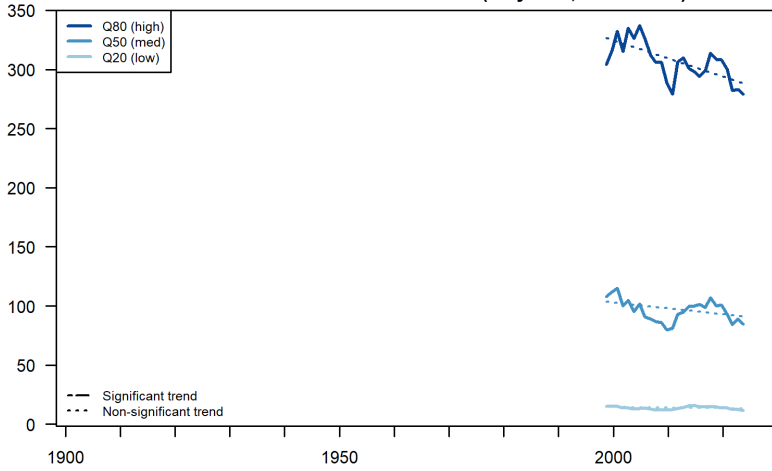


Station #14185900

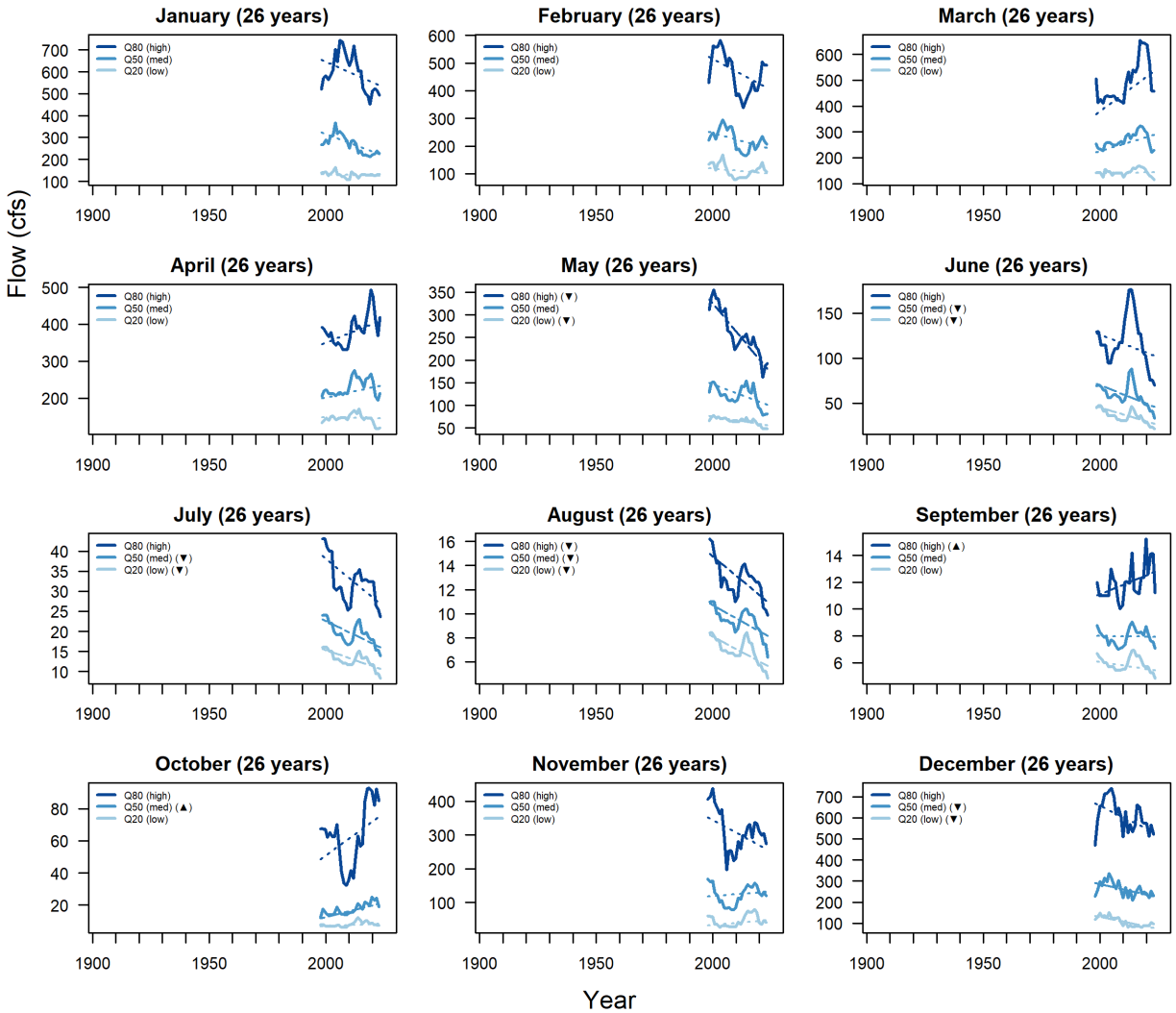
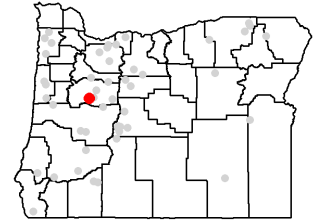


LT Flow Trends for Station #14187000

Annual Flow at Station #14187000 (26 years, 1998-2023)

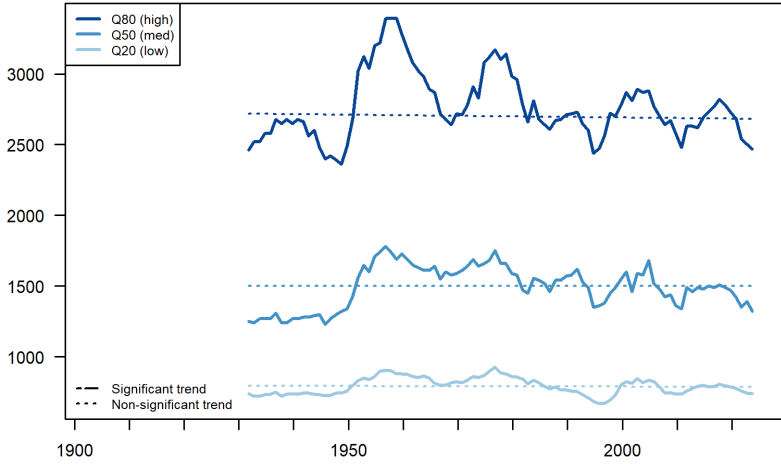


Station #14187000

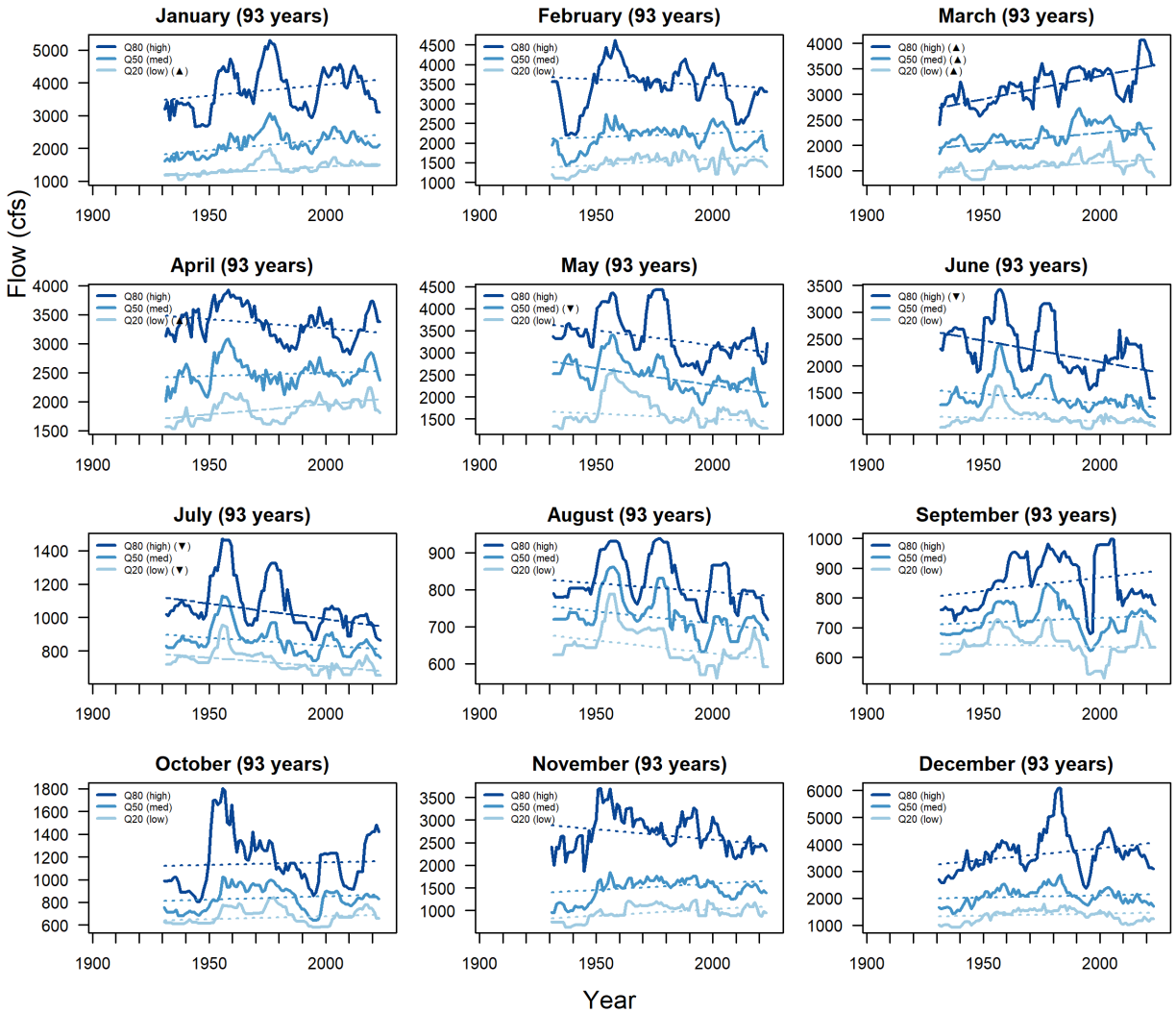
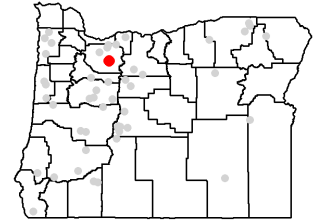


LT Flow Trends for Station #14209500

Annual Flow at Station #14209500 (93 years, 1931-2023)

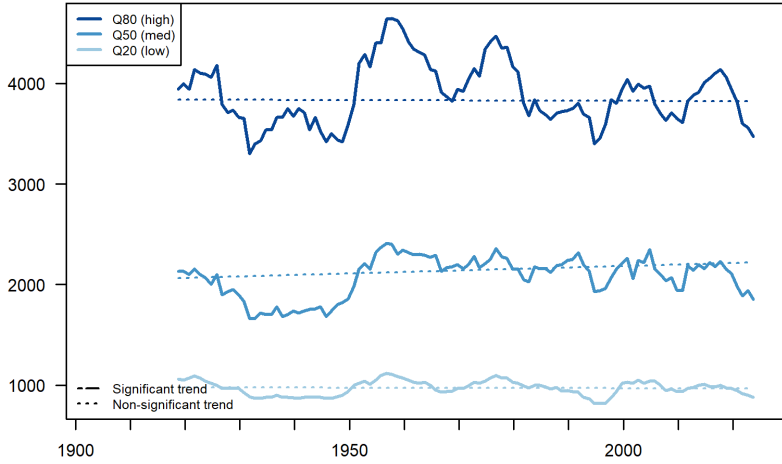


Station #14209500

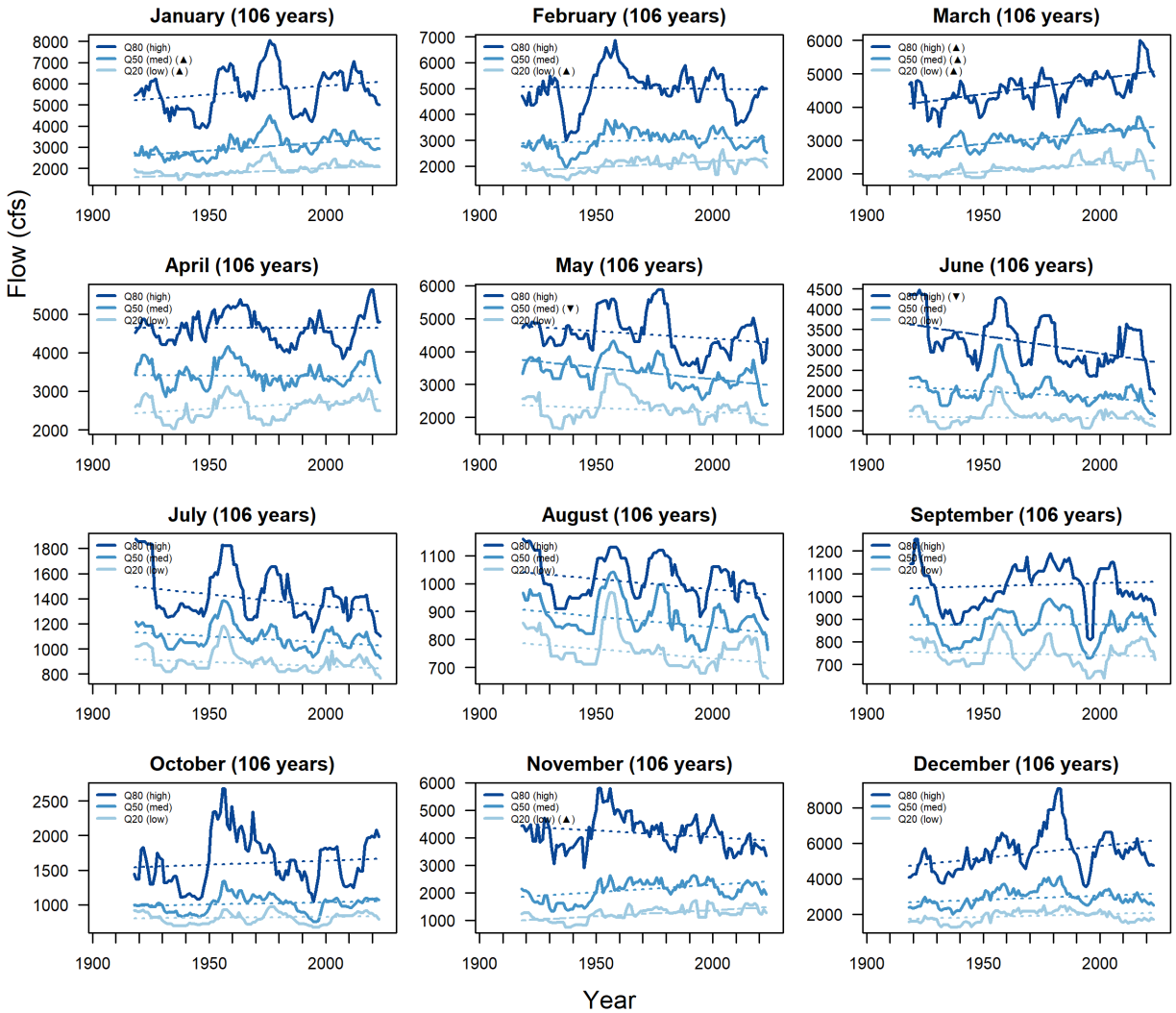
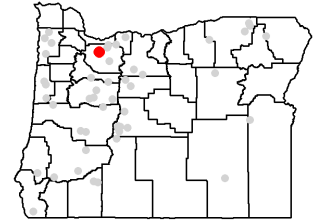


LT Flow Trends for Station #14210000

Annual Flow at Station #14210000 (106 years, 1918-2023)

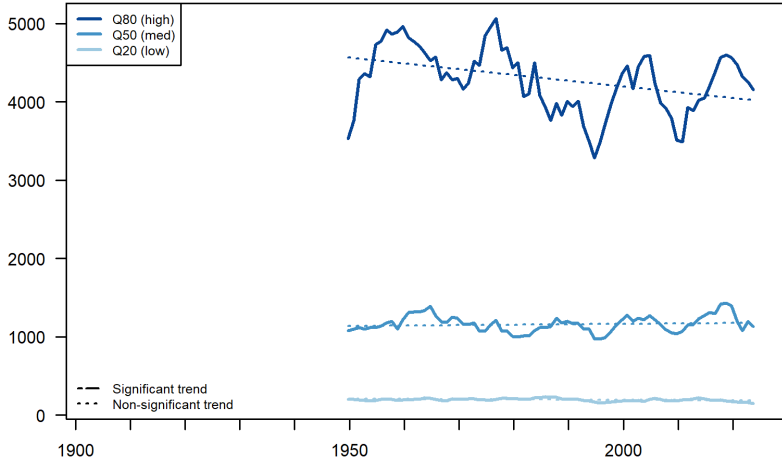


Station #14210000

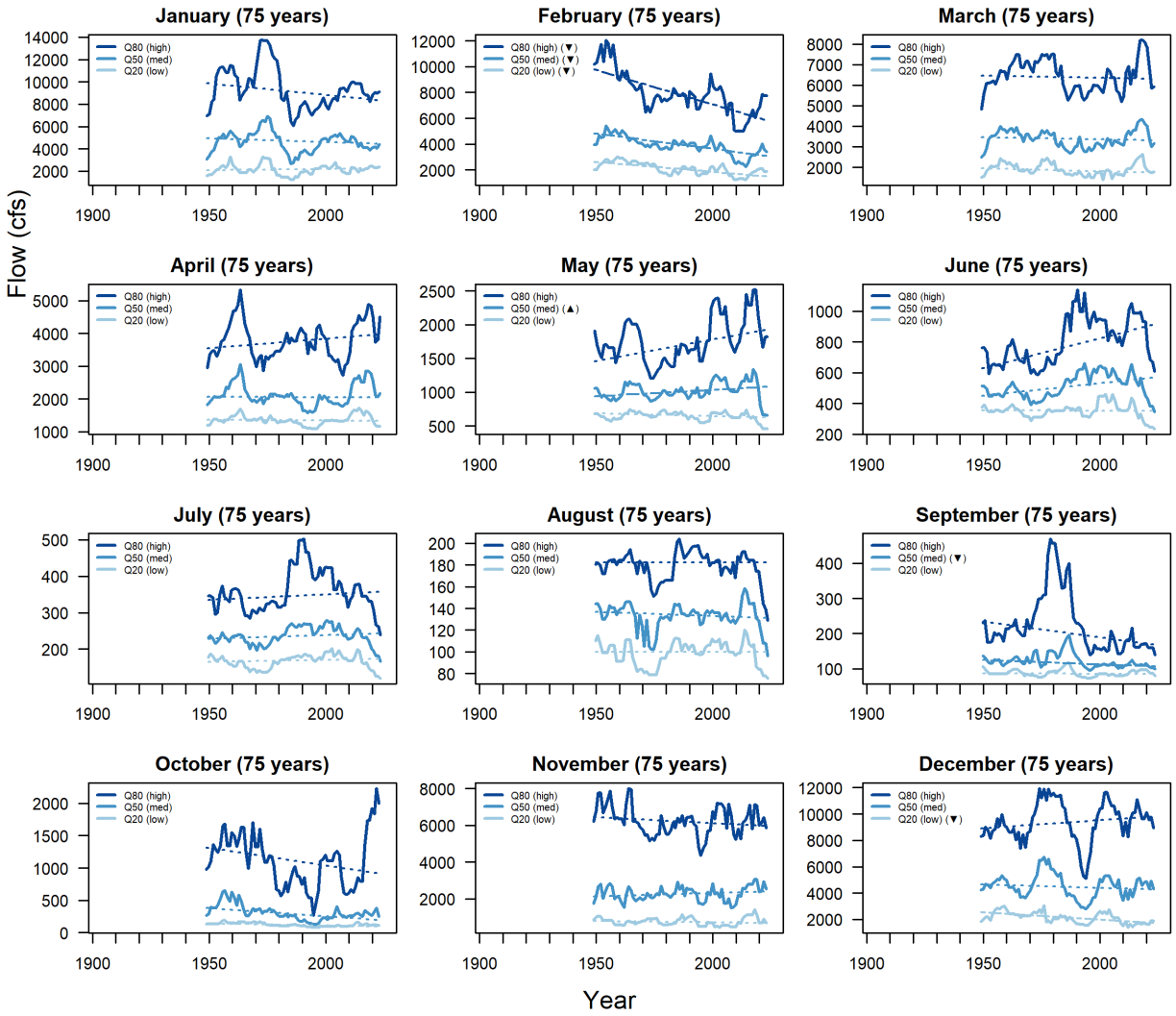
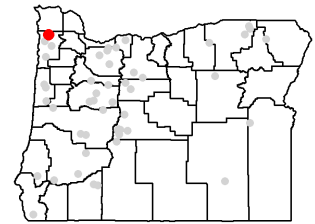


LT Flow Trends for Station #14301000

Annual Flow at Station #14301000 (75 years, 1949-2023)

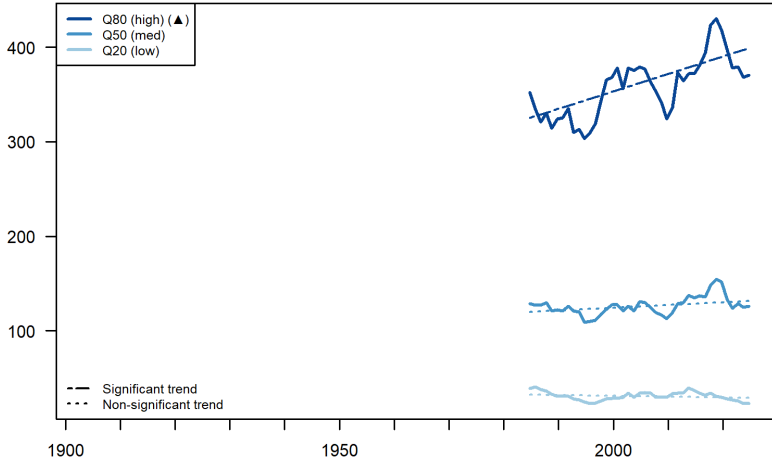


Station #14301000

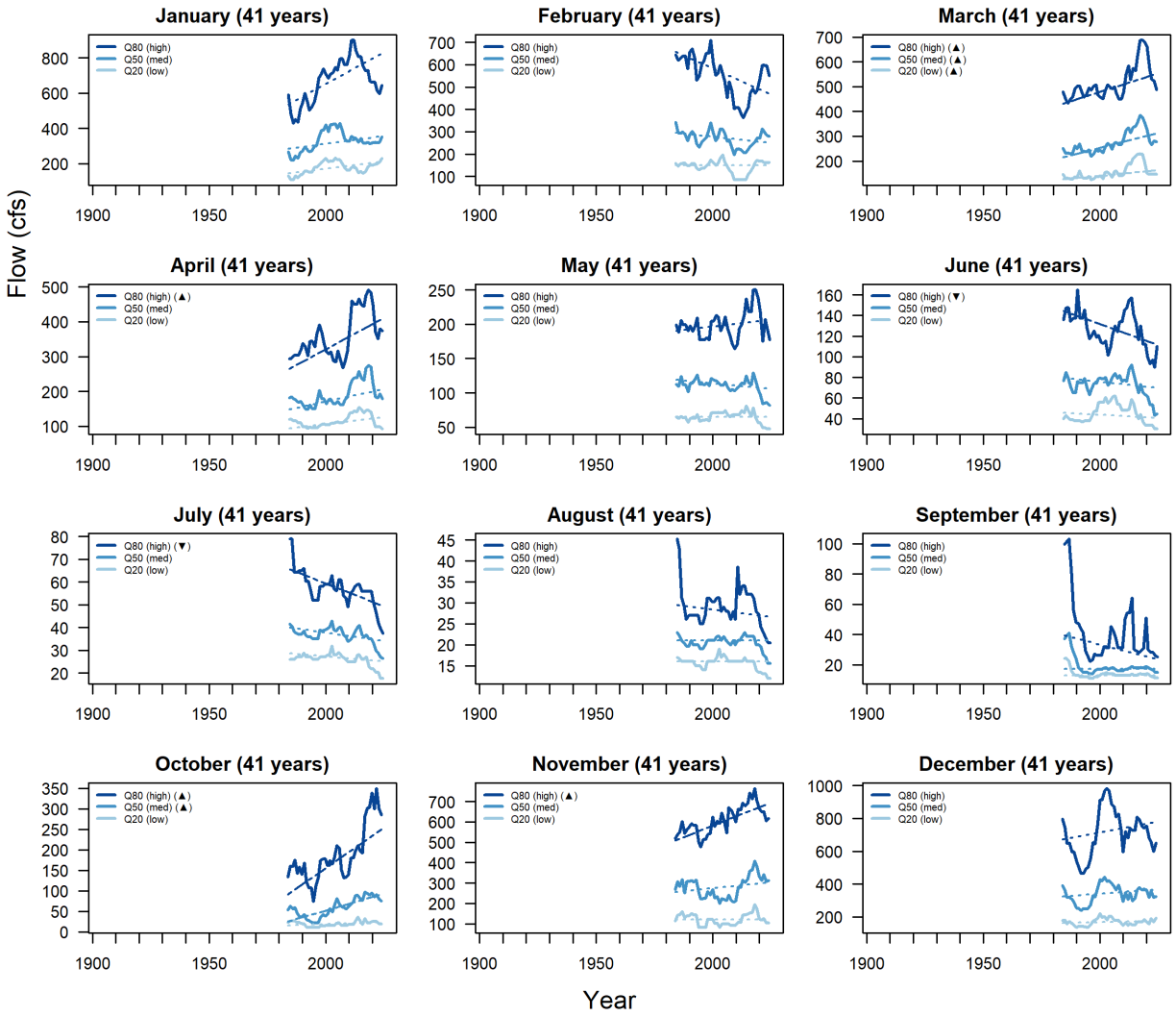
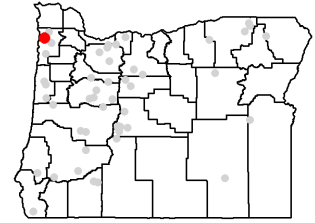


LT Flow Trends for Station #14301300

Annual Flow at Station #14301300 (41 years, 1984-2024)

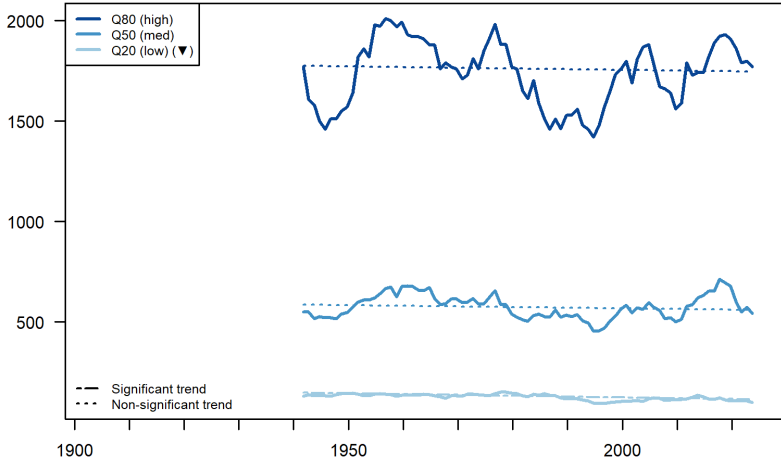


Station #14301300

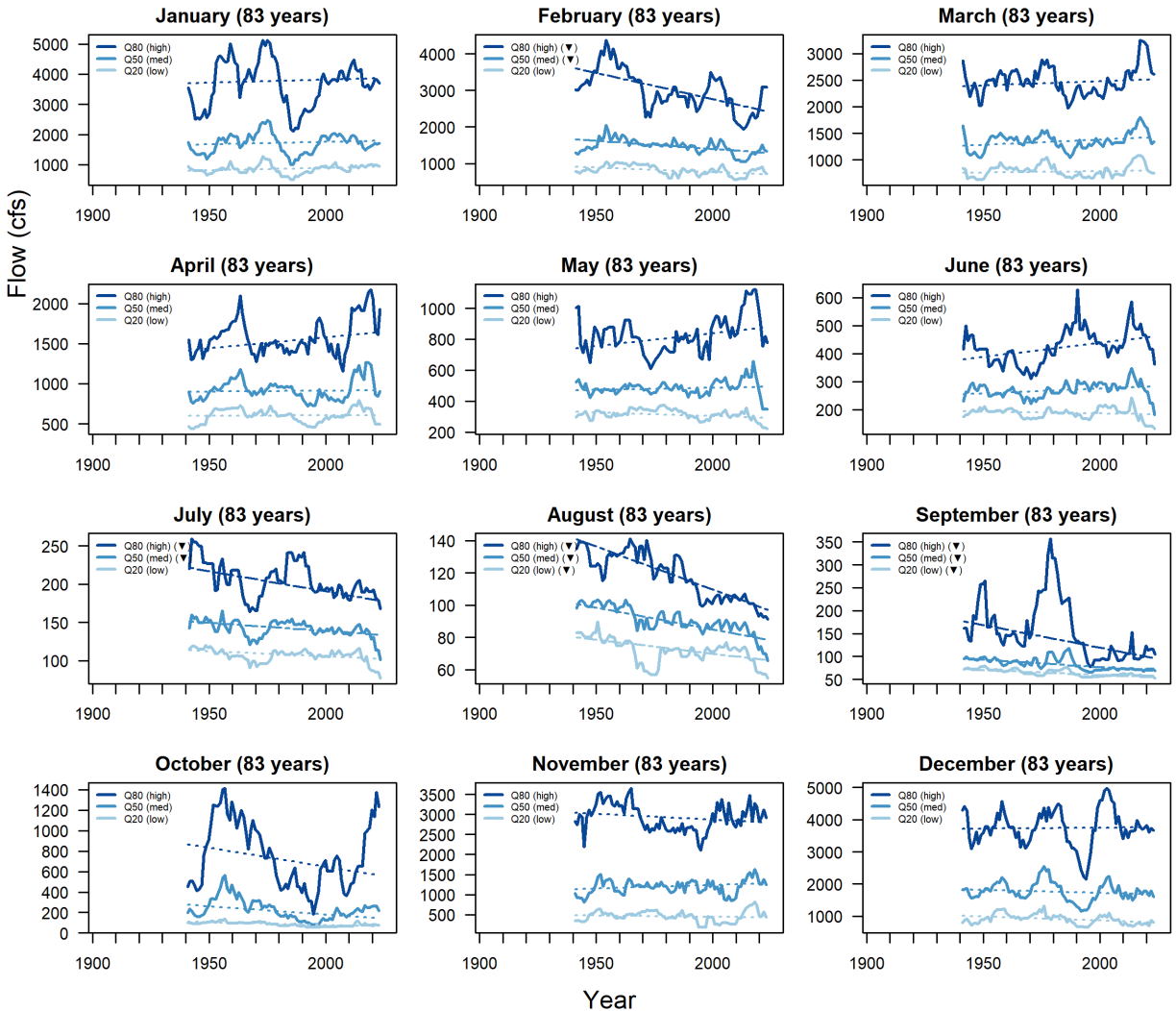
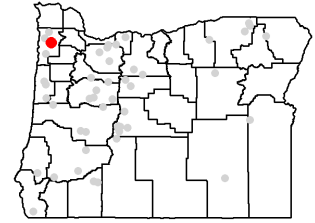


LT Flow Trends for Station #14301500

Annual Flow at Station #14301500 (83 years, 1941-2023)

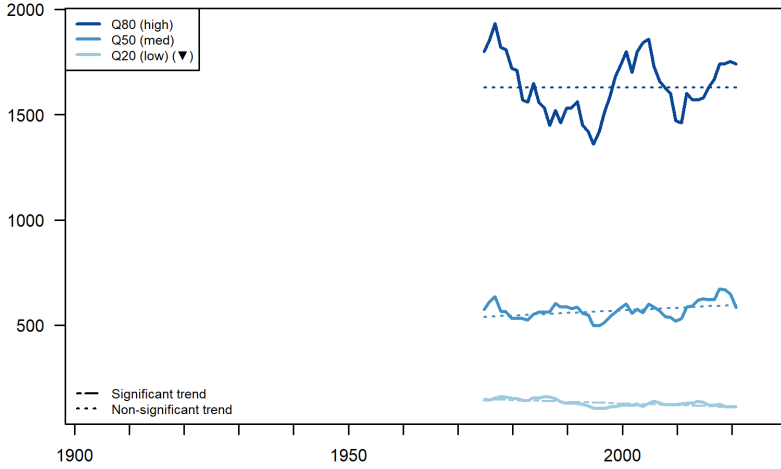


Station #14301500

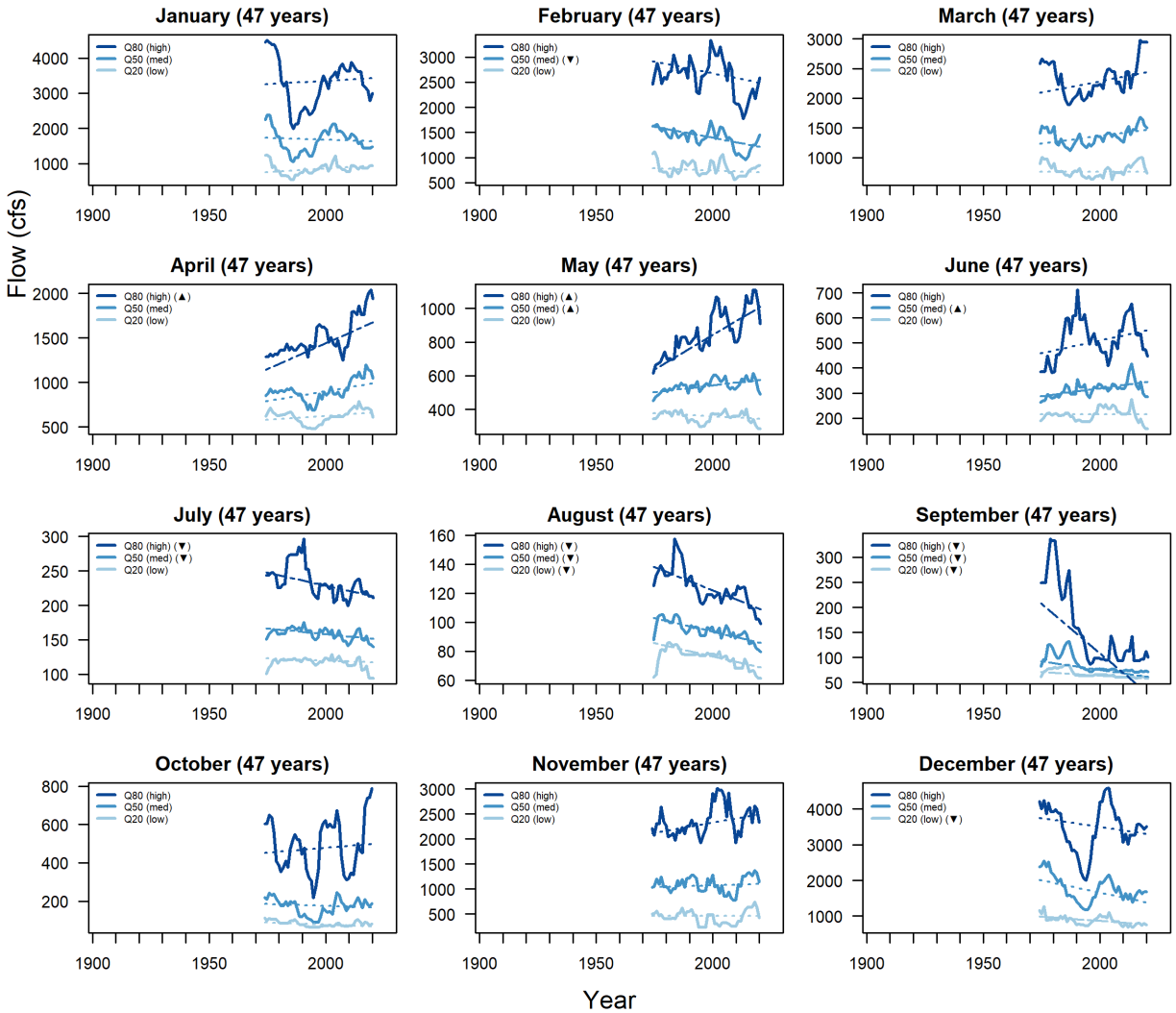
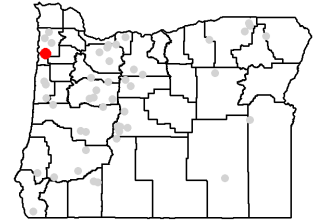


LT Flow Trends for Station #14303600

Annual Flow at Station #14303600 (47 years, 1974-2020)

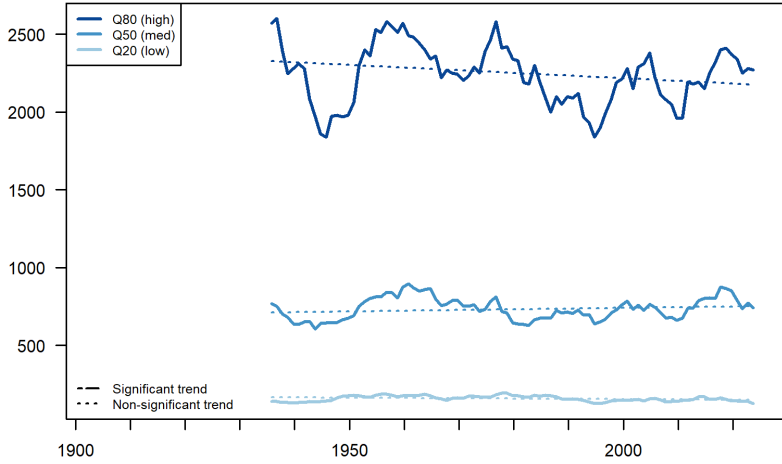


Station #14303600

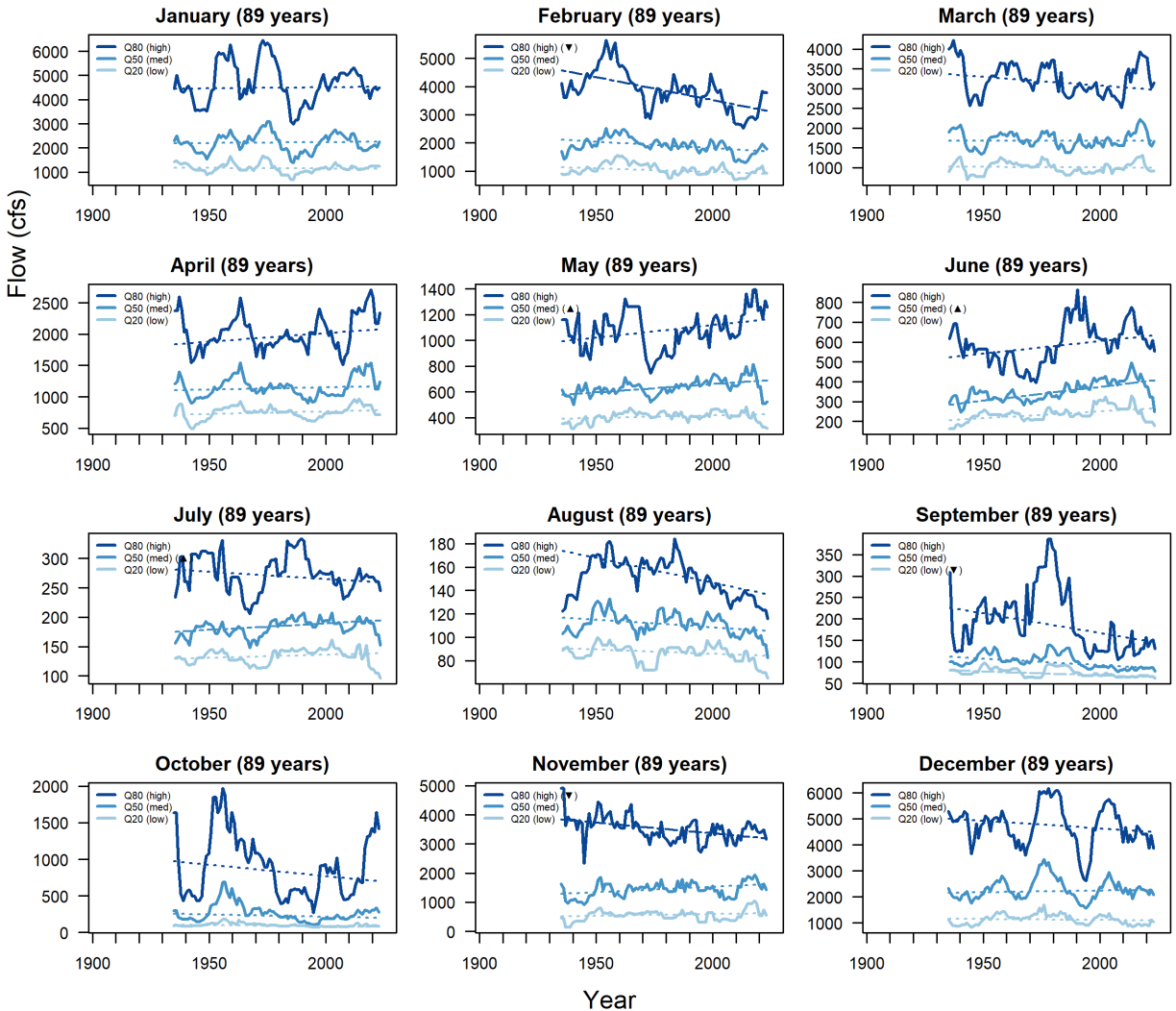
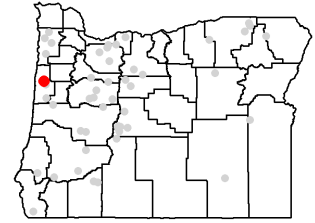


LT Flow Trends for Station #14305500

Annual Flow at Station #14305500 (89 years, 1935-2023)

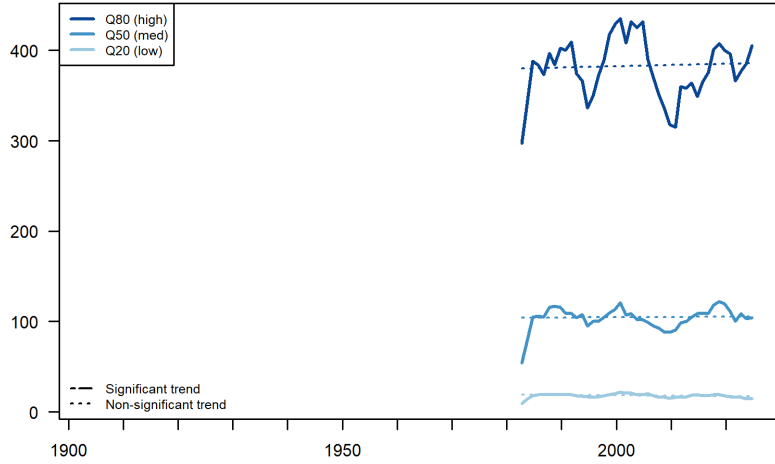


Station #14305500

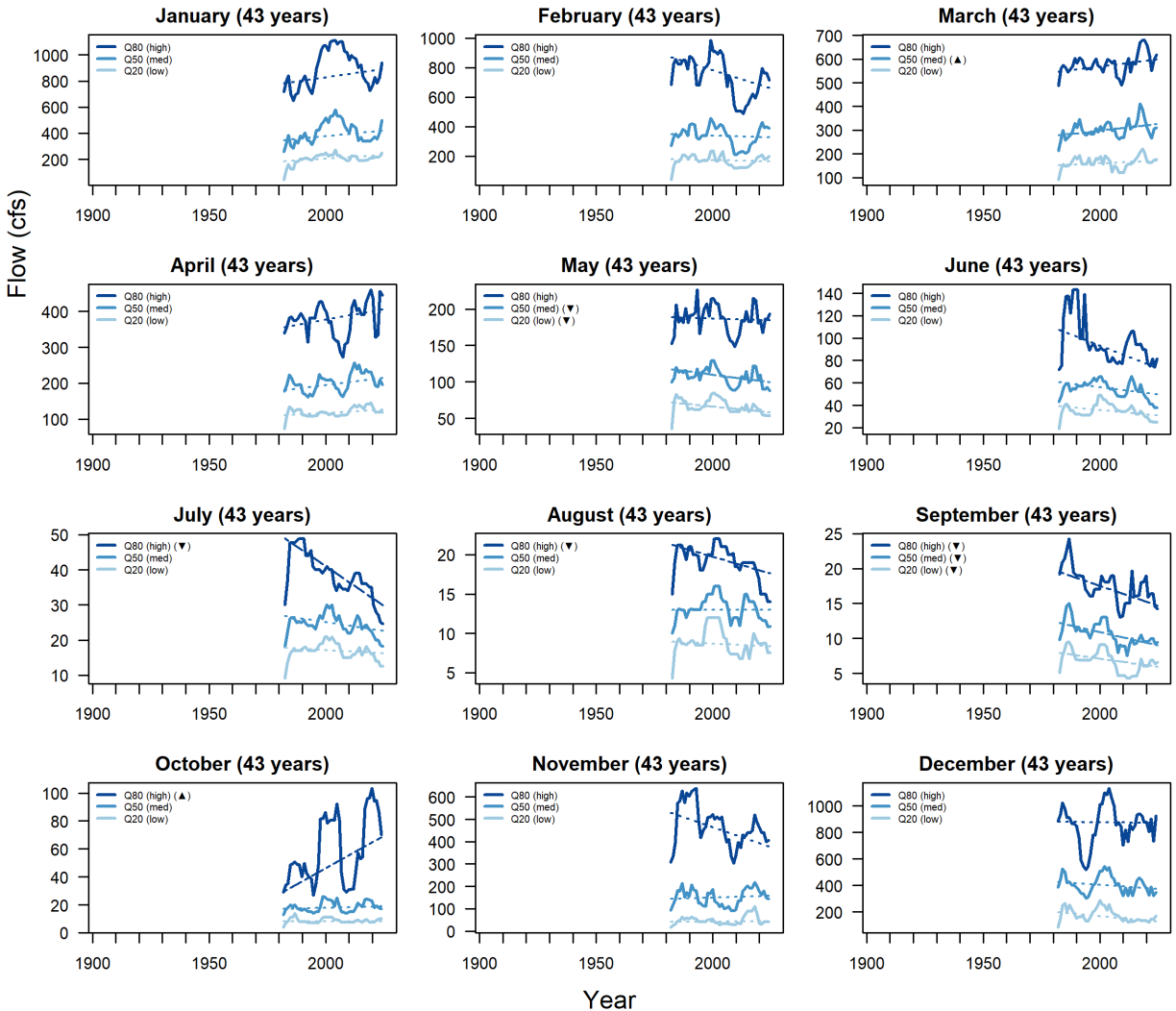
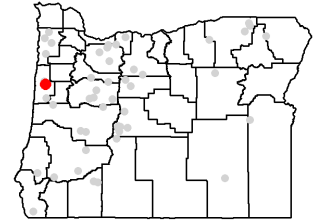


LT Flow Trends for Station #14306030

Annual Flow at Station #14306030 (43 years, 1982-2024)

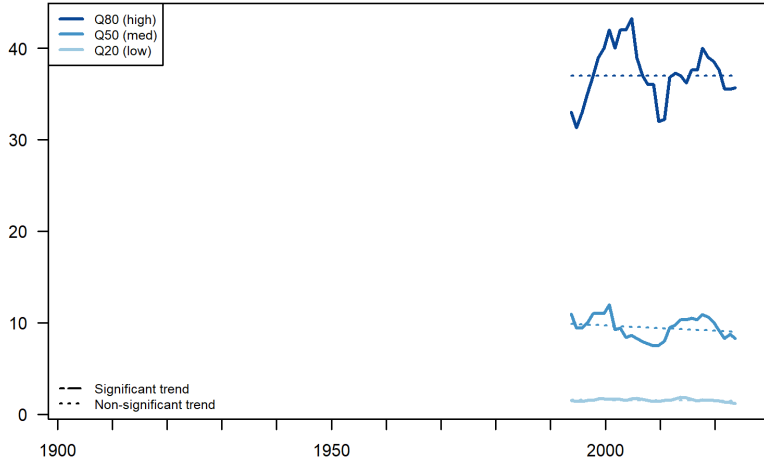


Station #14306030

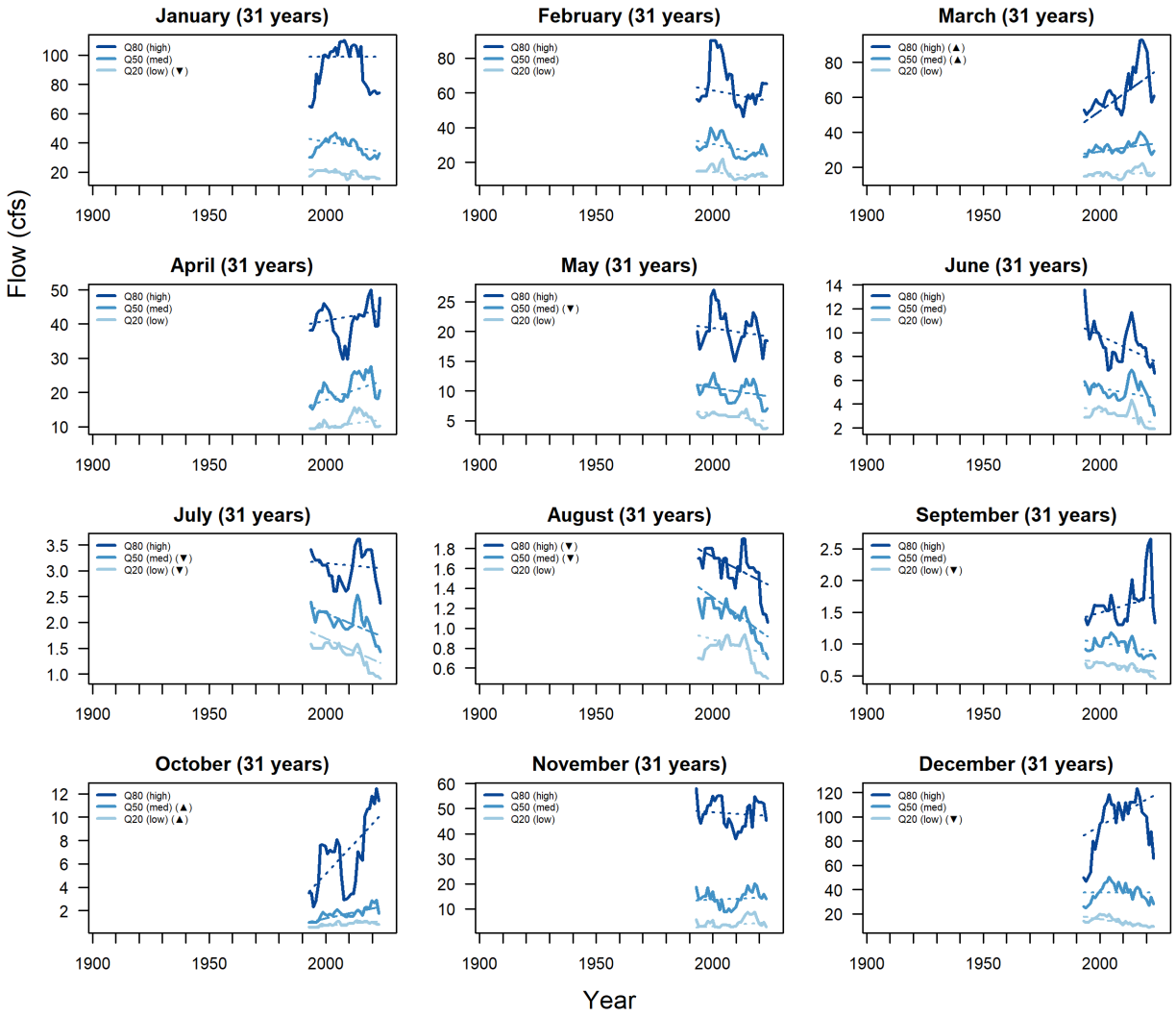
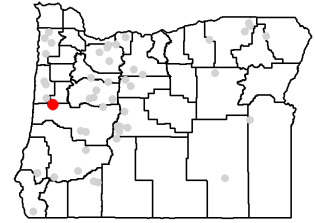


LT Flow Trends for Station #14306340

Annual Flow at Station #14306340 (31 years, 1993-2023)

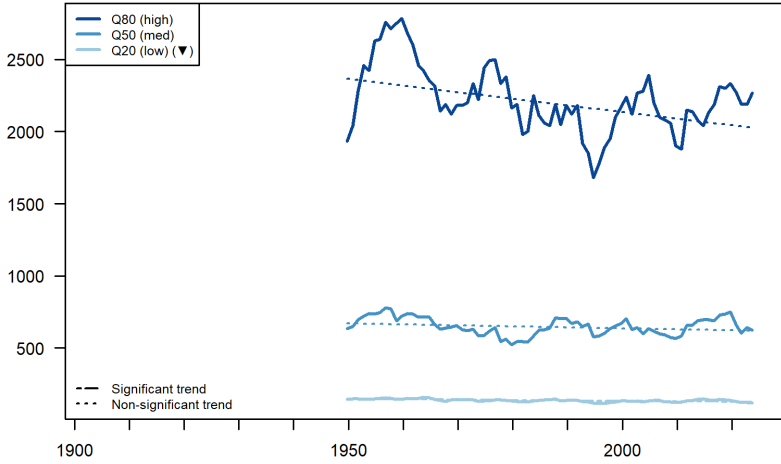


Station #14306340

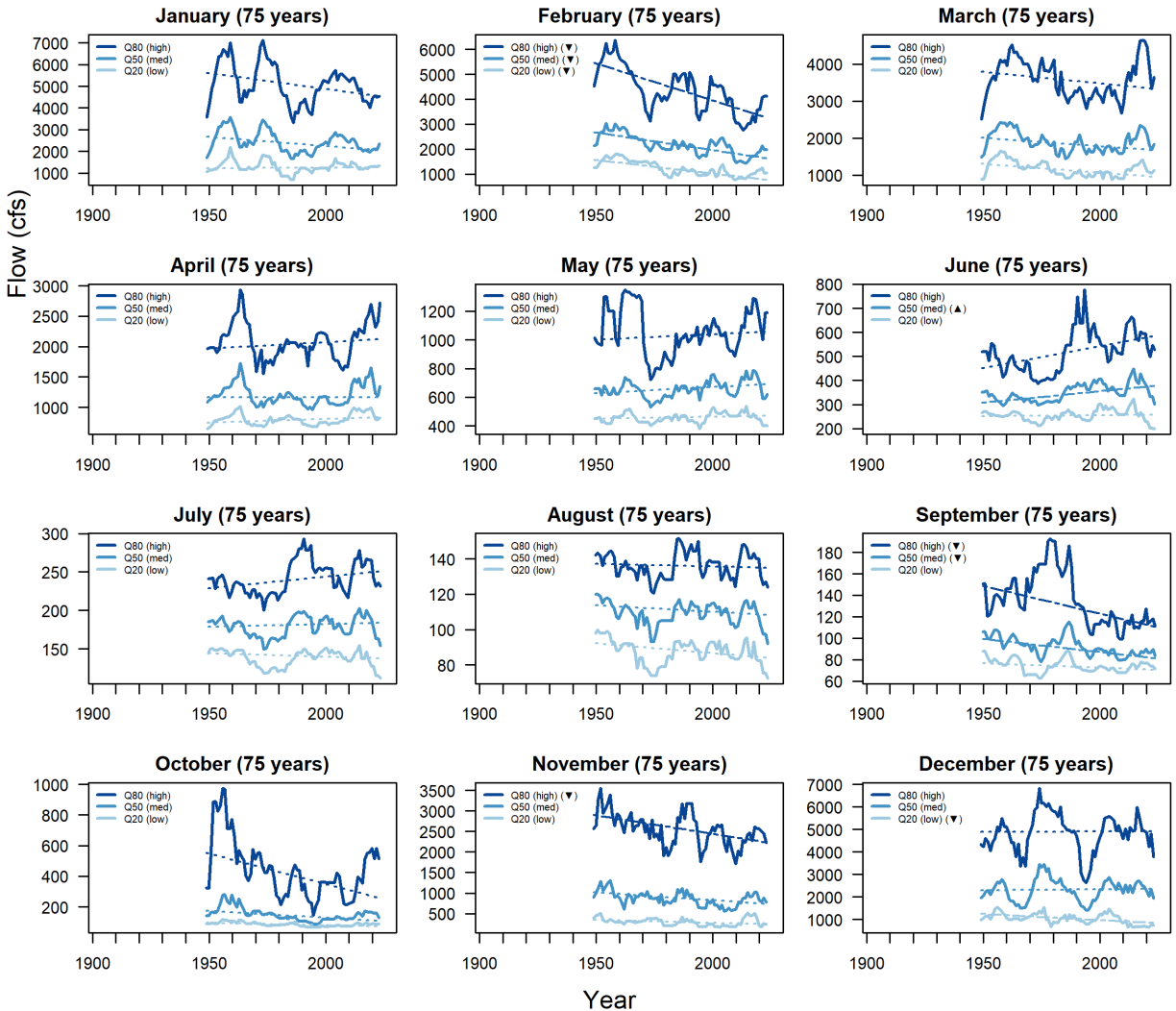
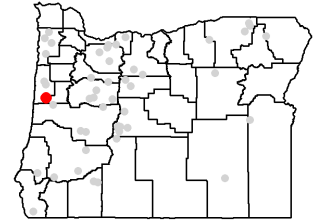


LT Flow Trends for Station #14306500

Annual Flow at Station #14306500 (75 years, 1949-2023)

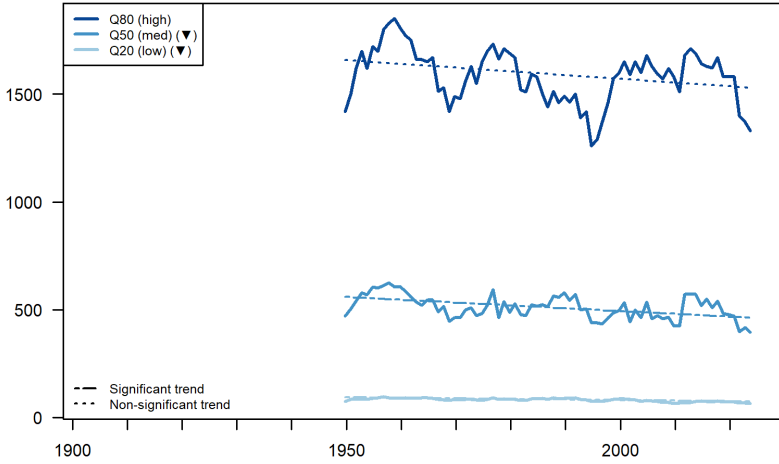


Station #14306500

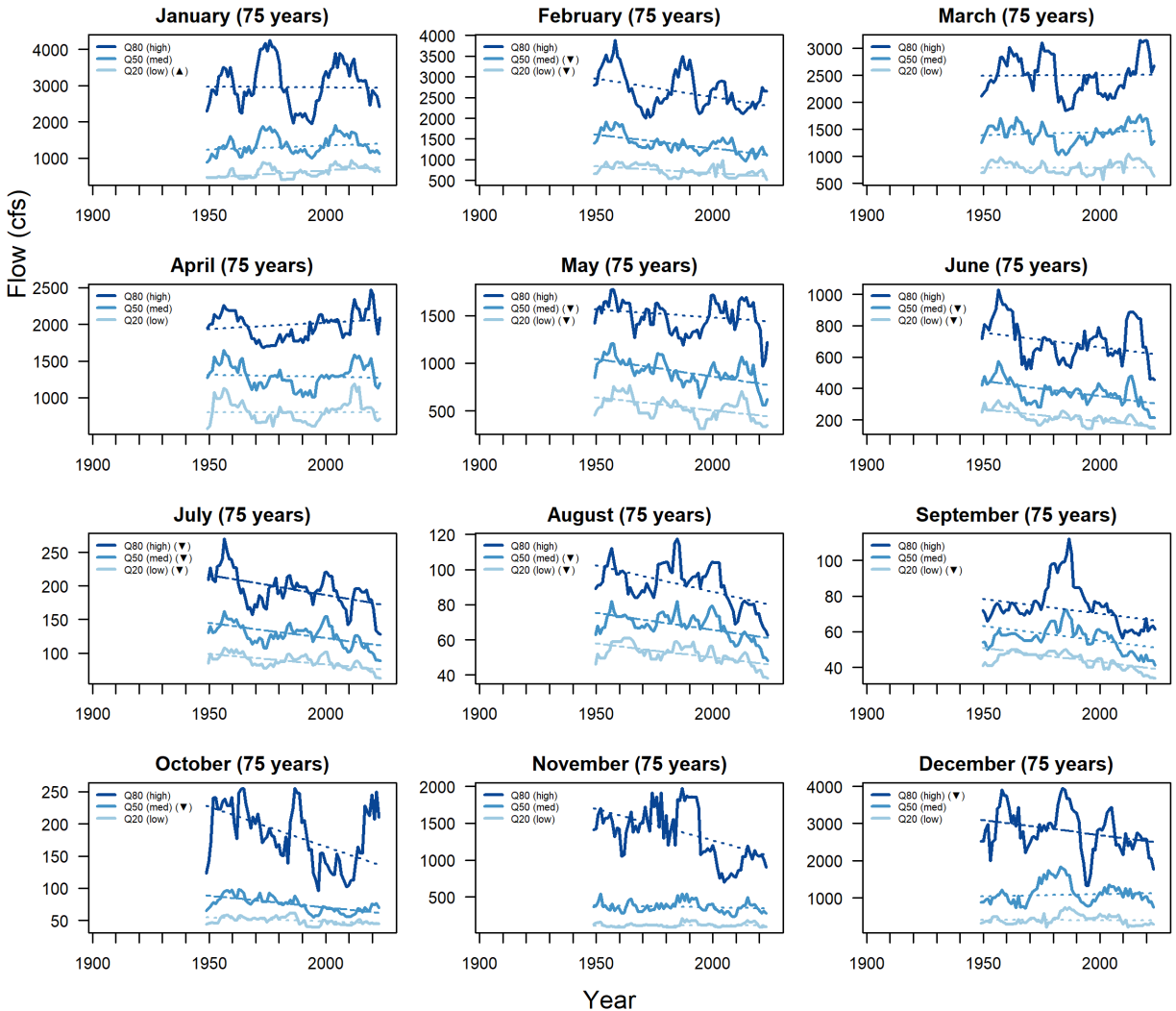
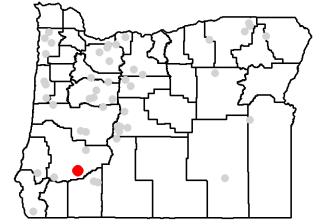


# LT Flow Trends for Station #14308000

## Annual Flow at Station #14308000 (75 years, 1949-2023)

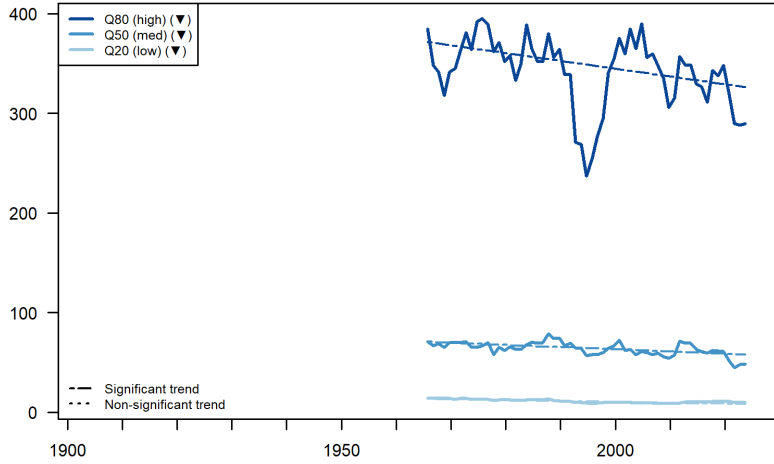


## Station #14308000

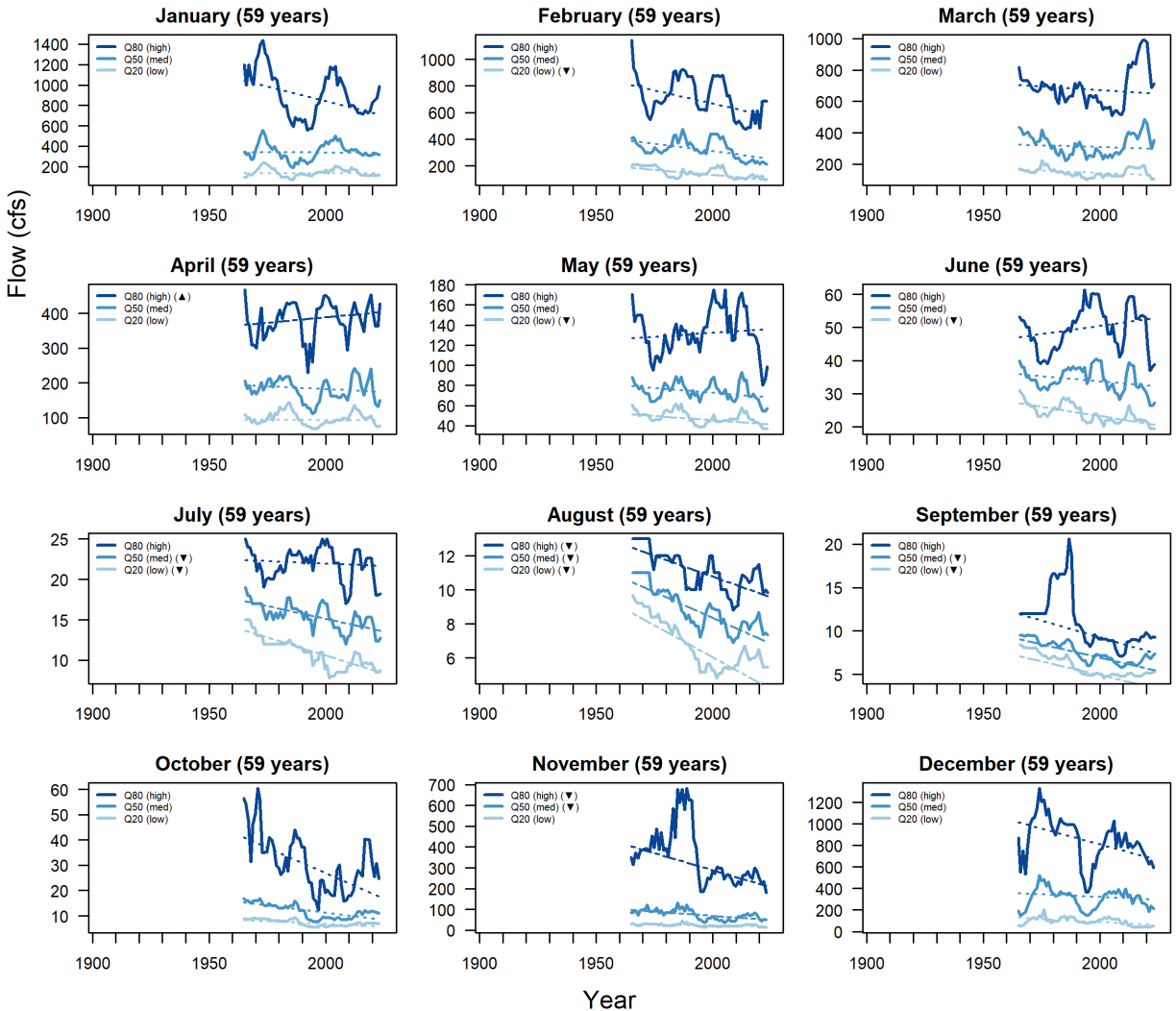
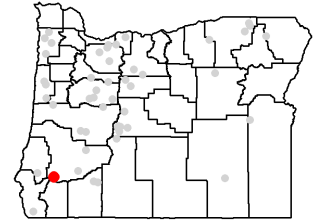


LT Flow Trends for Station #14309500

Annual Flow at Station #14309500 (59 years, 1965-2023)

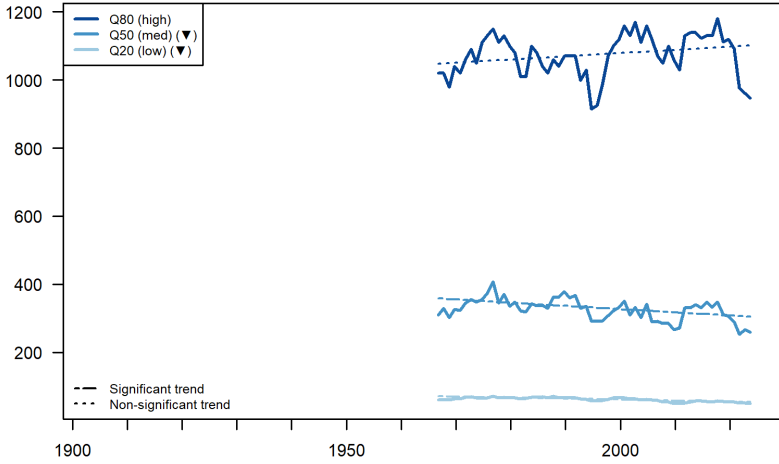


Station #14309500

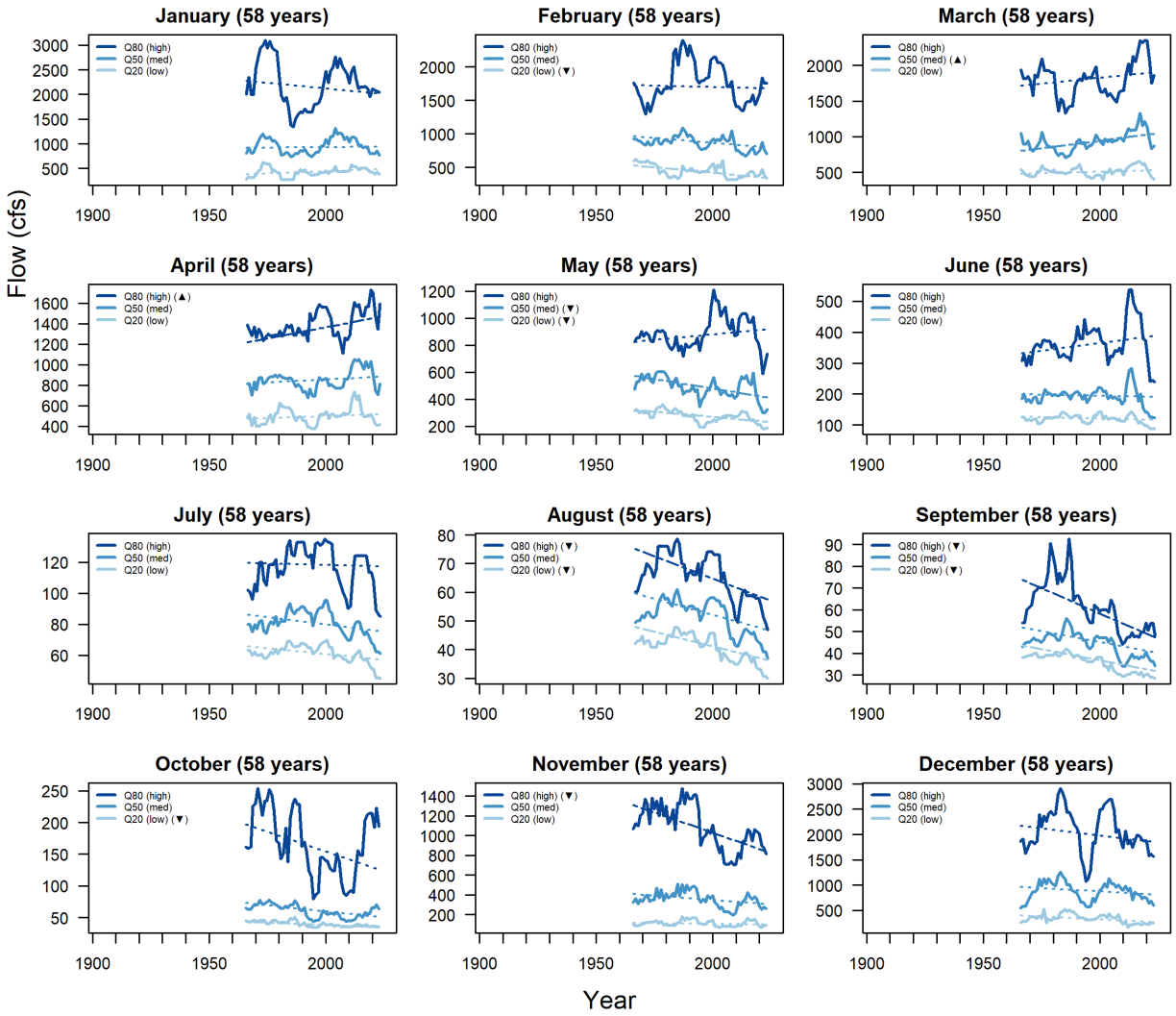
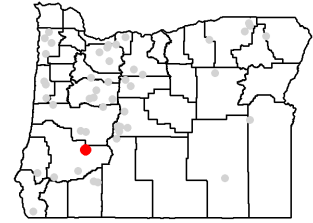


LT Flow Trends for Station #14316700

Annual Flow at Station #14316700 (58 years, 1966-2023)

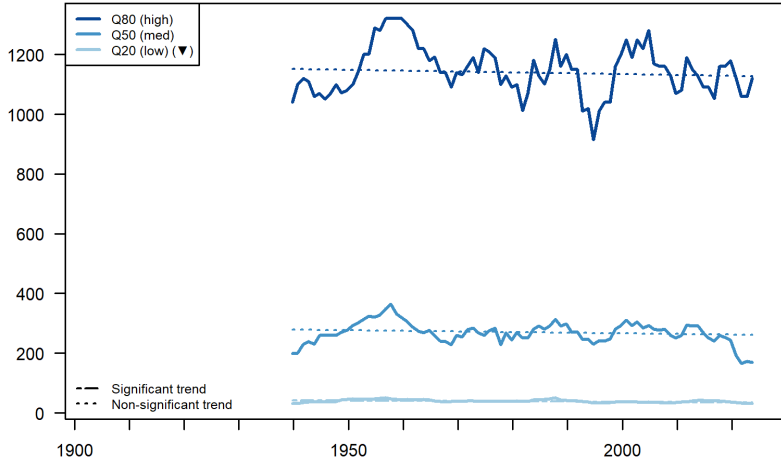


Station #14316700

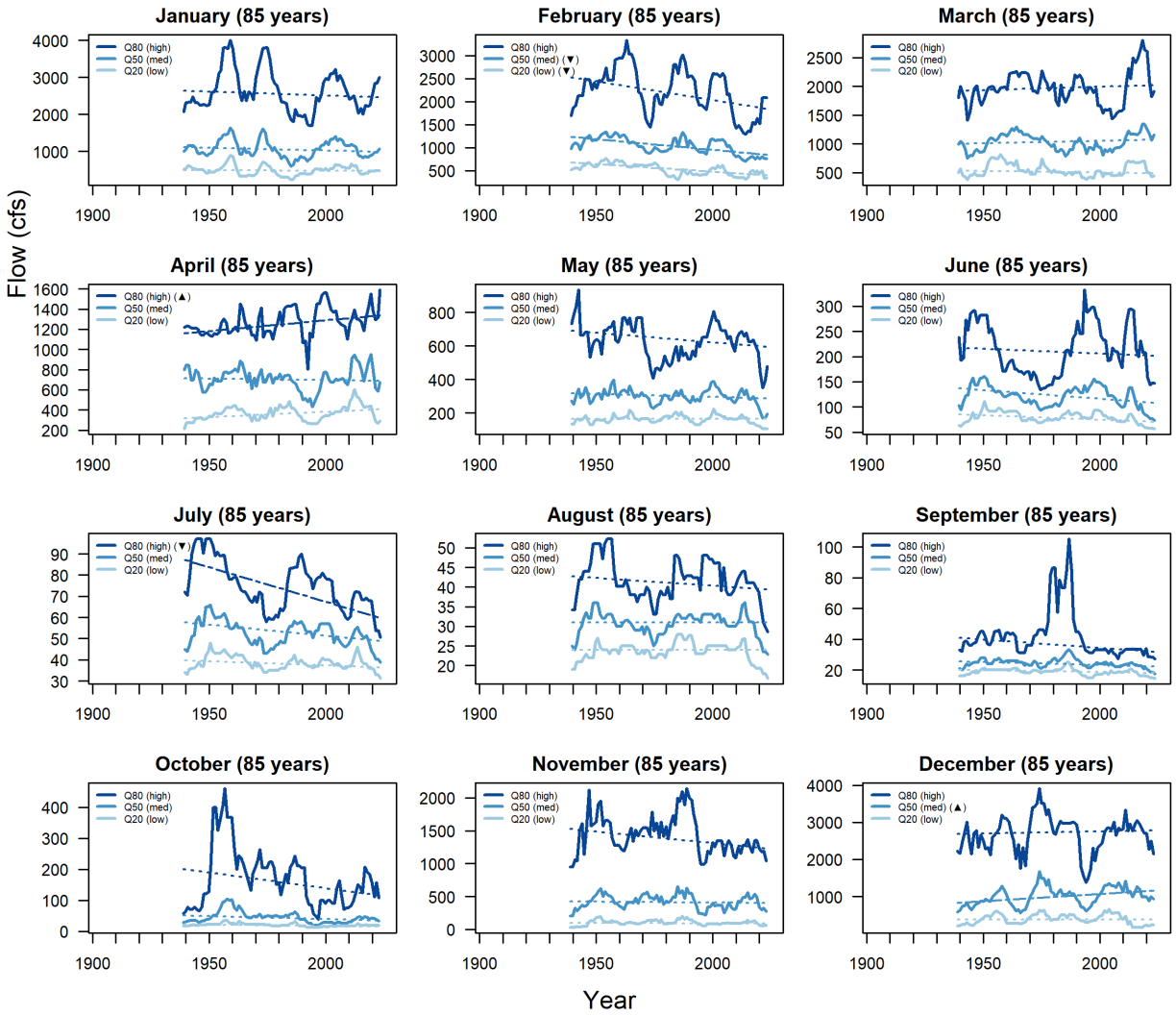
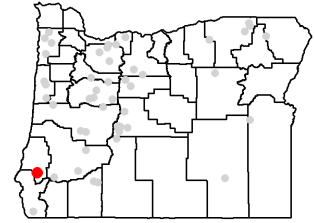


LT Flow Trends for Station #14325000

Annual Flow at Station #14325000 (85 years, 1939-2023)

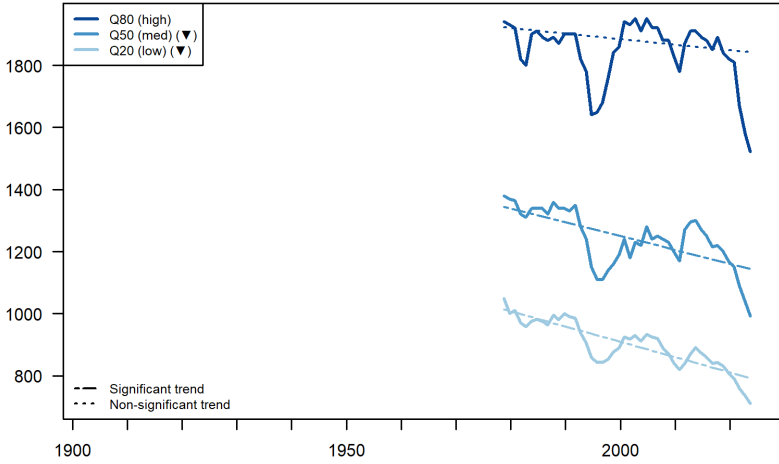


Station #14325000

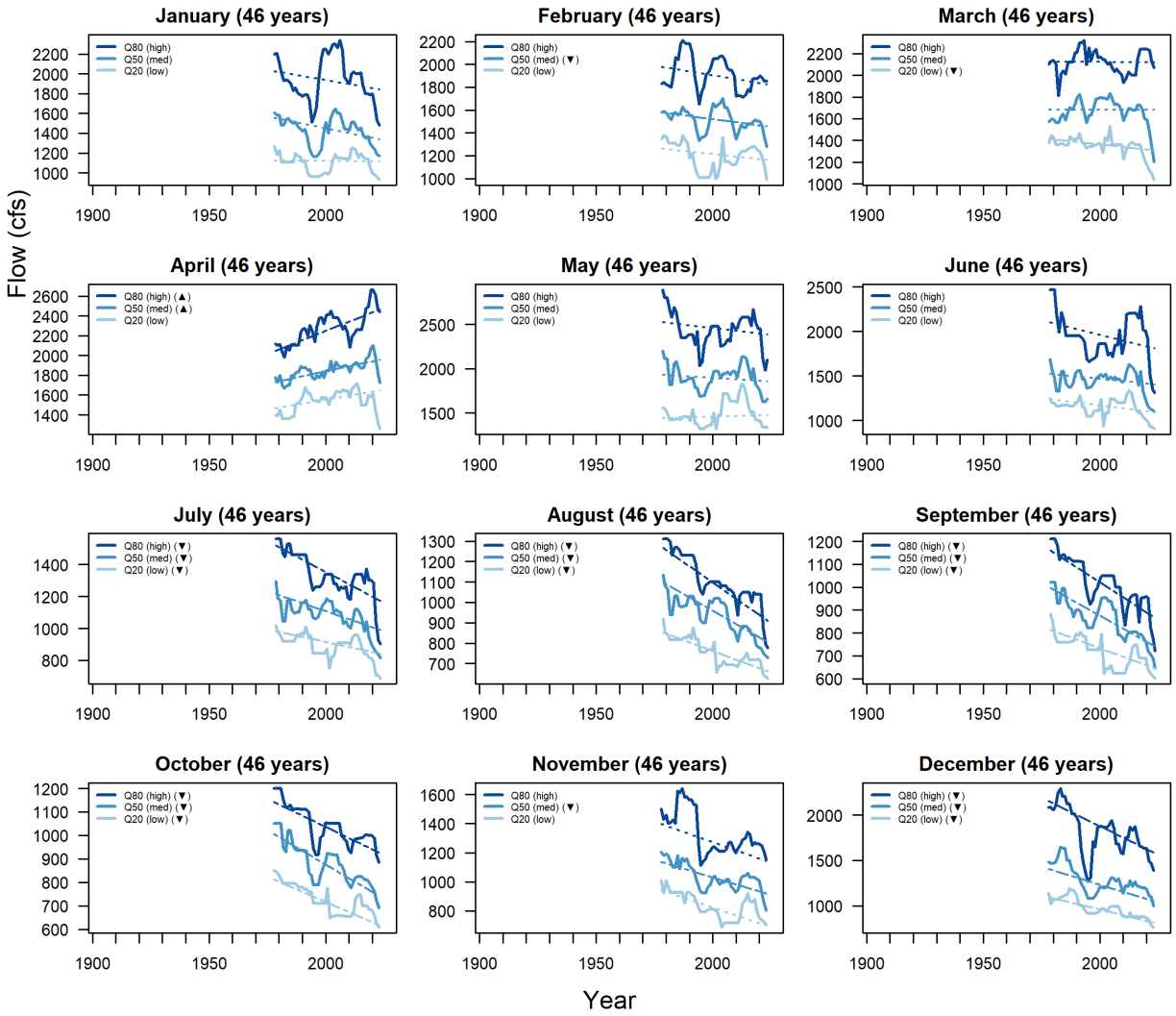
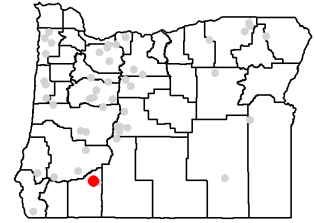


LT Flow Trends for Station #14330000

Annual Flow at Station #14330000 (46 years, 1978-2023)

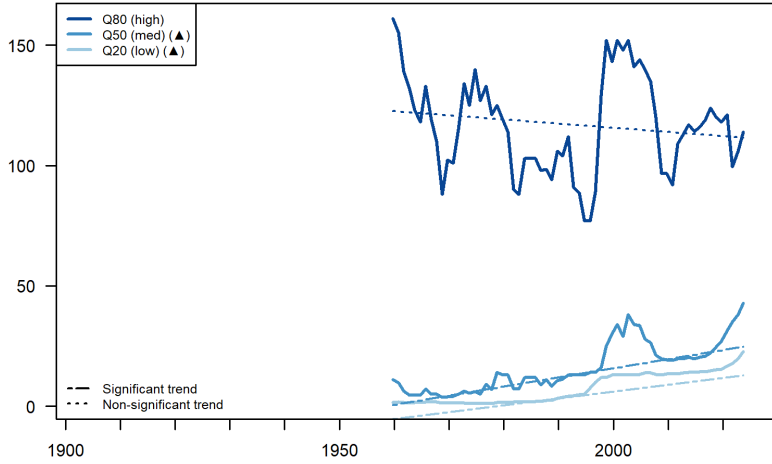


Station #14330000

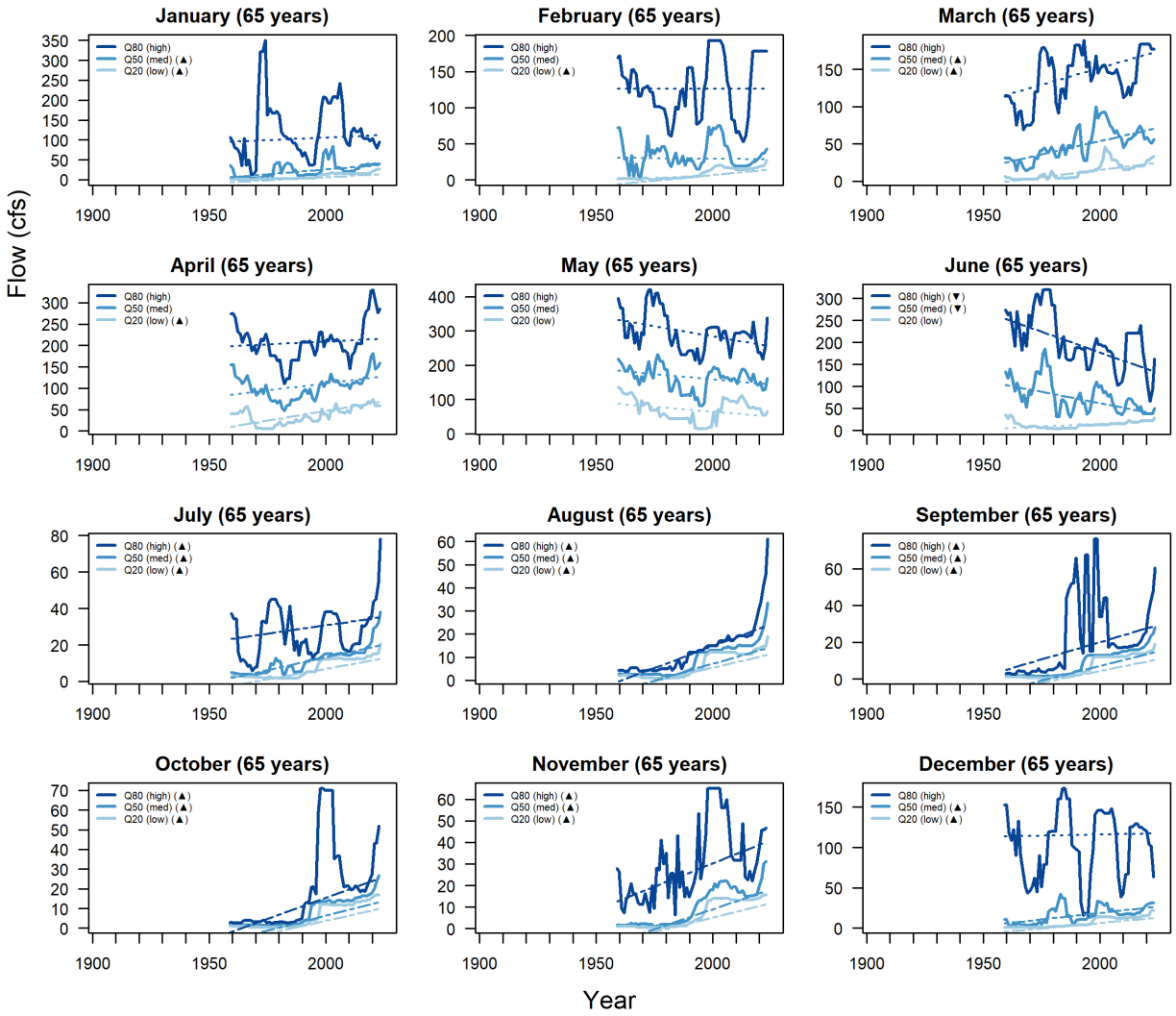
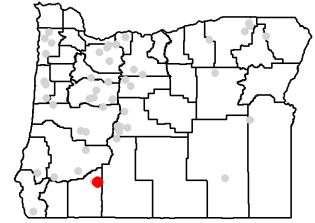


LT Flow Trends for Station #14332000

Annual Flow at Station #14332000 (65 years, 1959-2023)

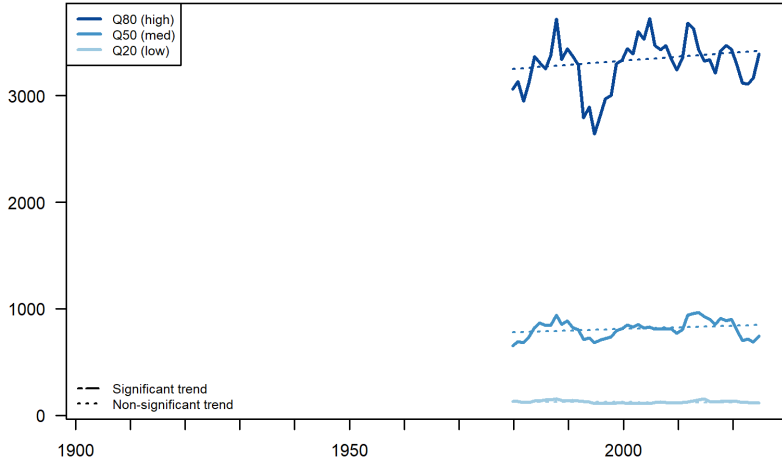


Station #14332000

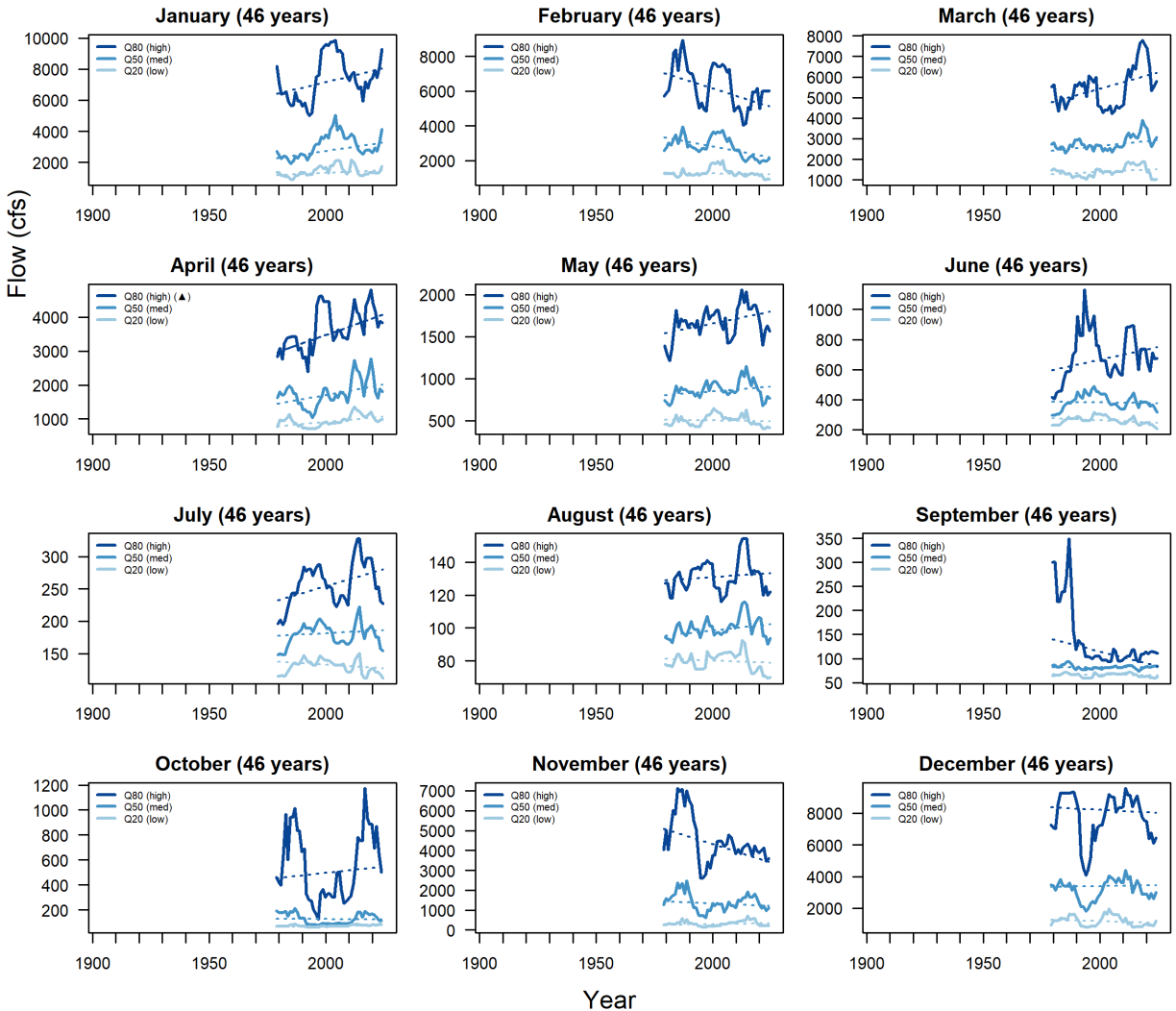
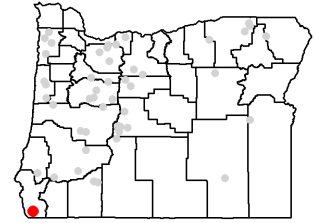


LT Flow Trends for Station #14400000

Annual Flow at Station #14400000 (46 years, 1979-2024)



Station #14400000

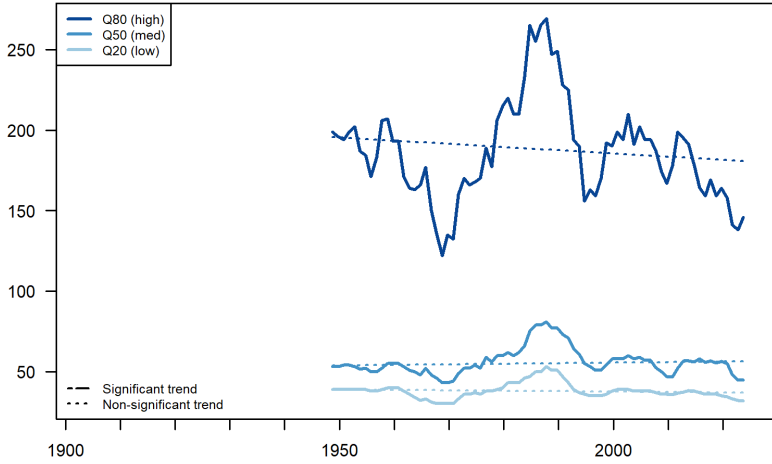


## Appendix I: Individual Station Results – Moving Window Percentile Analysis – Base Period

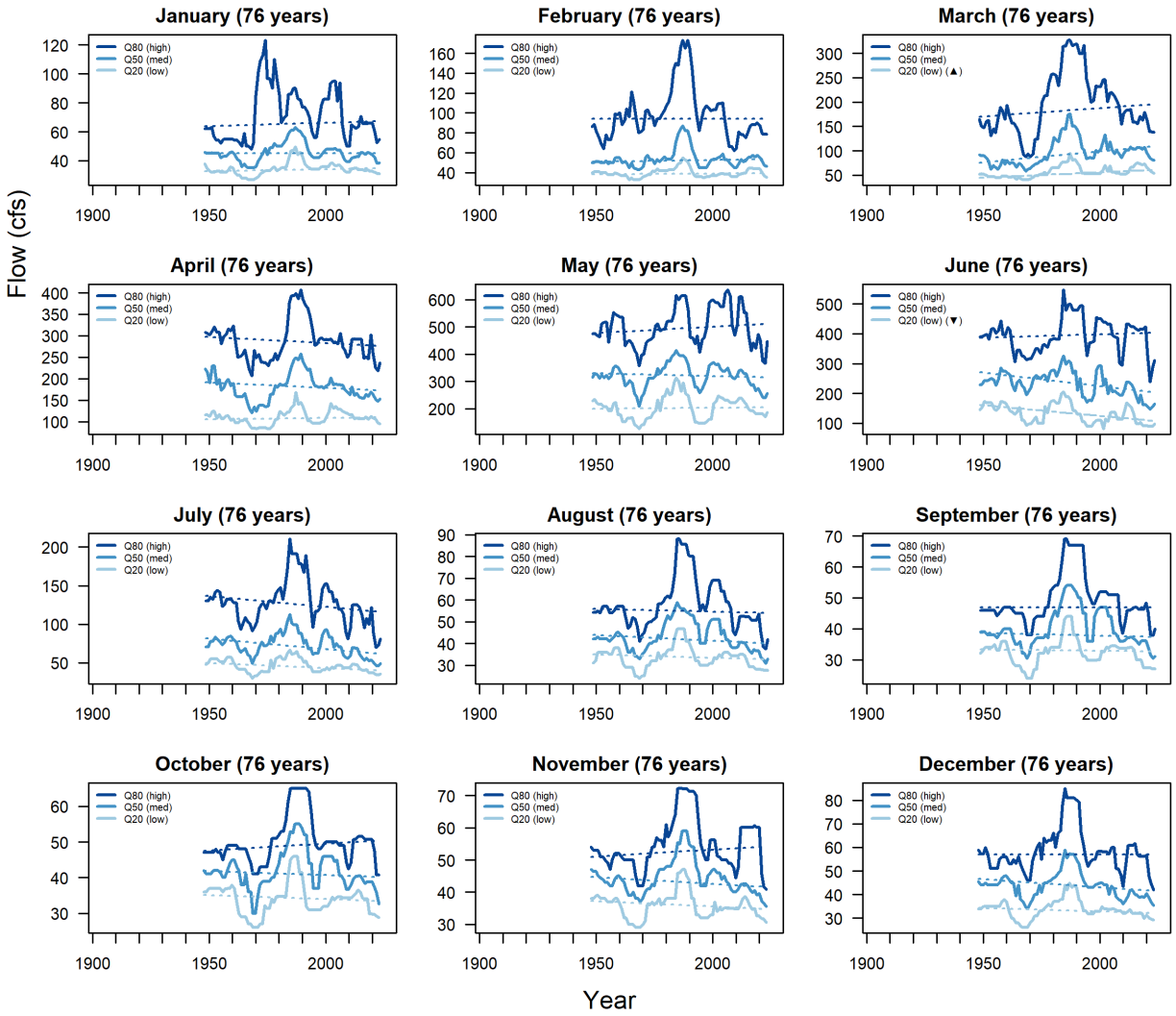
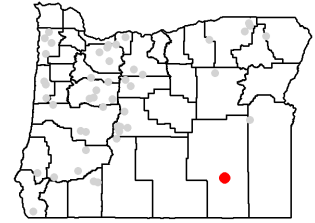
Trend analysis of 10-year moving percentiles for streamflow stations for the base period (water years 1991-2020). Each figure shows the 10-year moving average annual flow (top panel) and monthly flows (12 smaller panels) for 20th, 50th, and 80th non-exceedance percentile (Q) flows. Upward (▲) and downward (▼) triangles in legends indicate significant trends ( $p < 0.05$ ). Trendlines superimposed over time series data; dotted line is non-significant, while dashed line is significant. Note that y-axis varies among subplots within the same figure.

LT Flow Trends for Station #10396000

Annual Flow at Station #10396000 (76 years, 1948-2023)

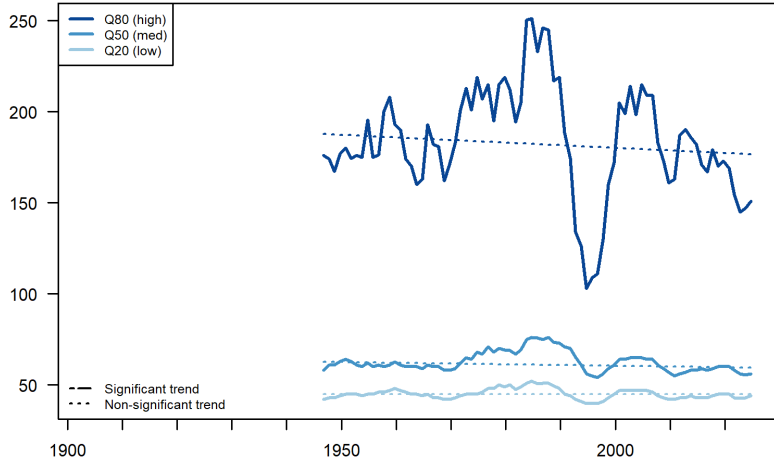


Station #10396000

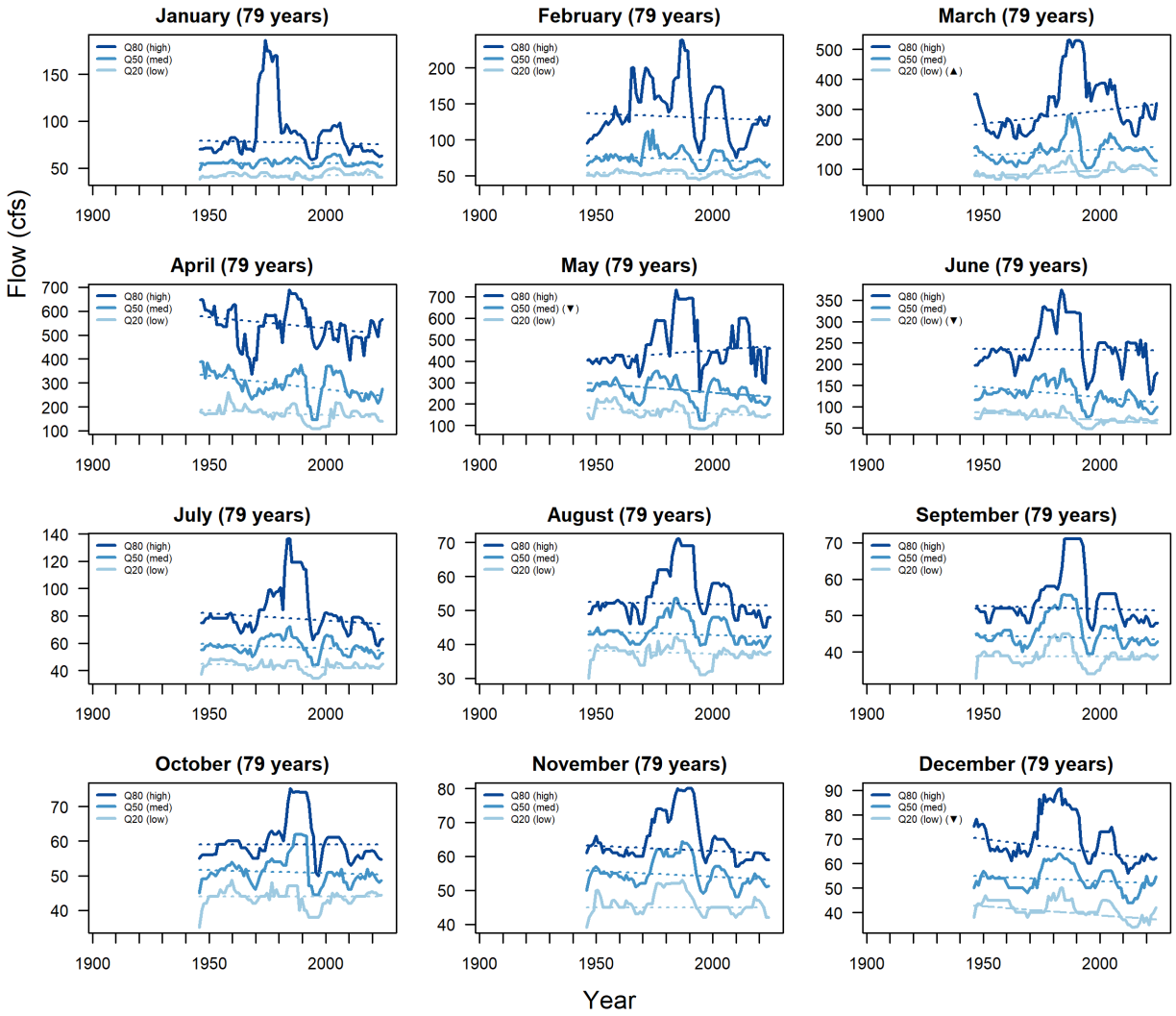
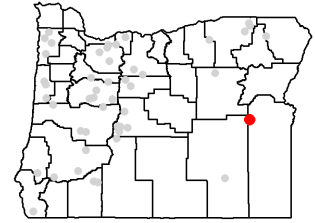


LT Flow Trends for Station #13216500

Annual Flow at Station #13216500 (79 years, 1946-2024)

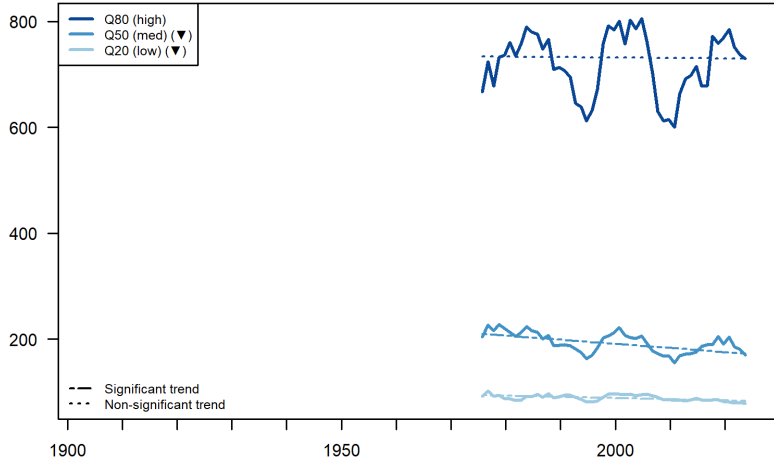


Station #13216500

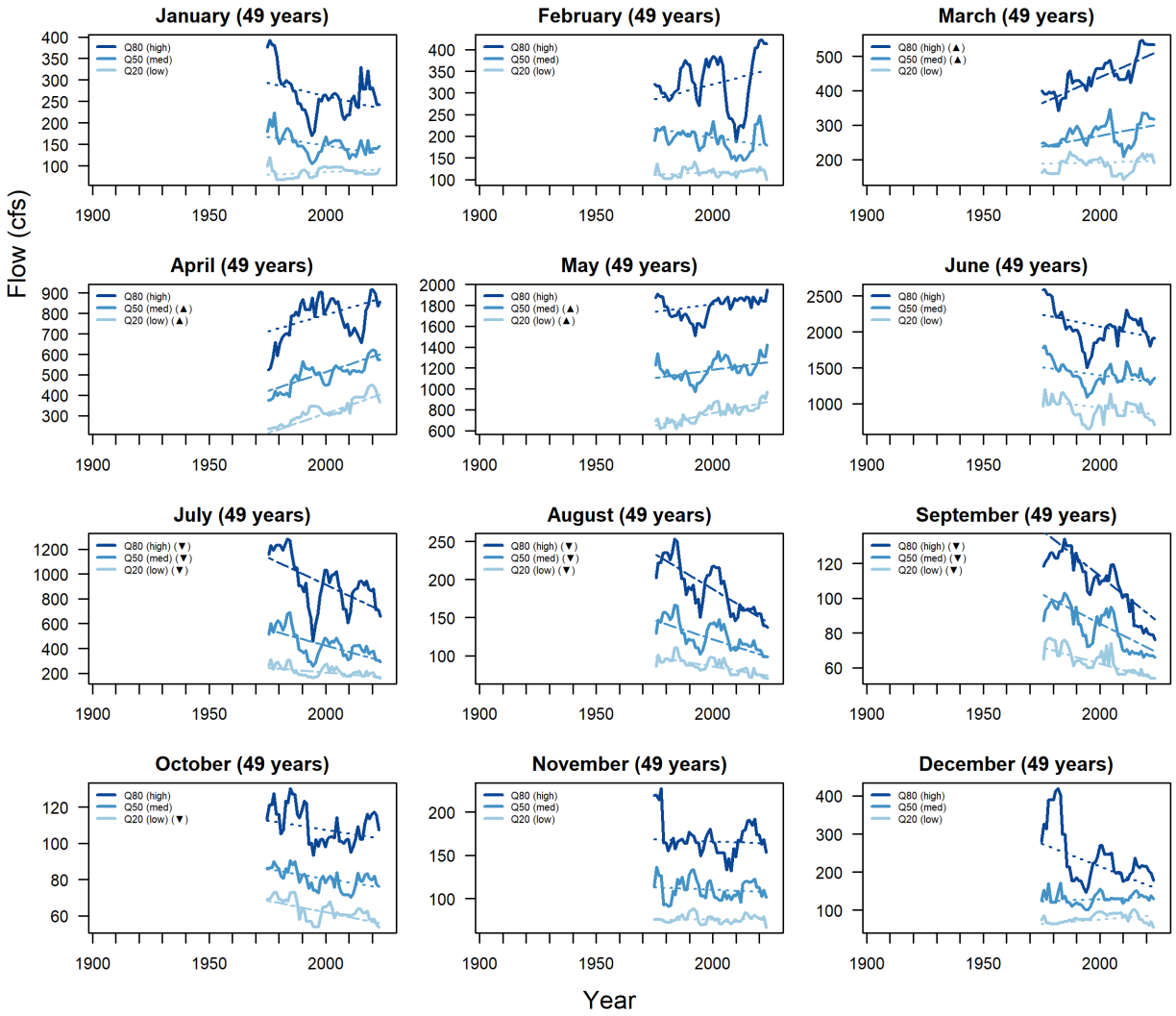
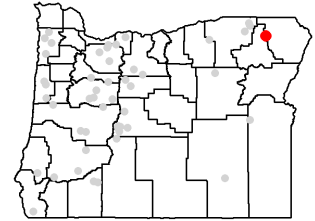


LT Flow Trends for Station #13331500

Annual Flow at Station #13331500 (49 years, 1975-2023)

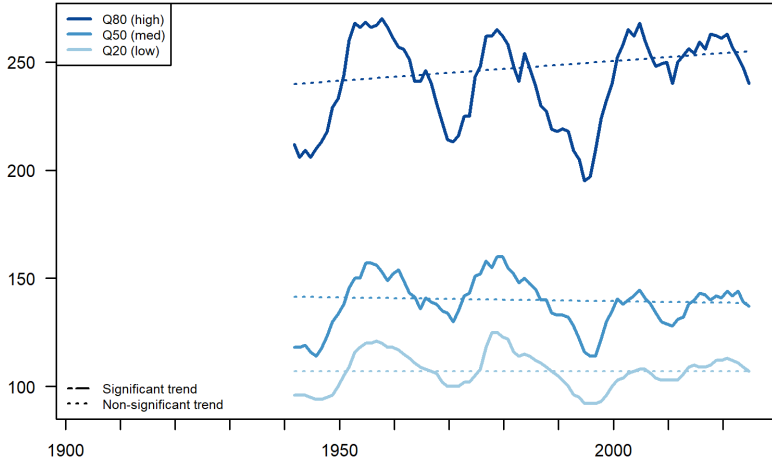


Station #13331500

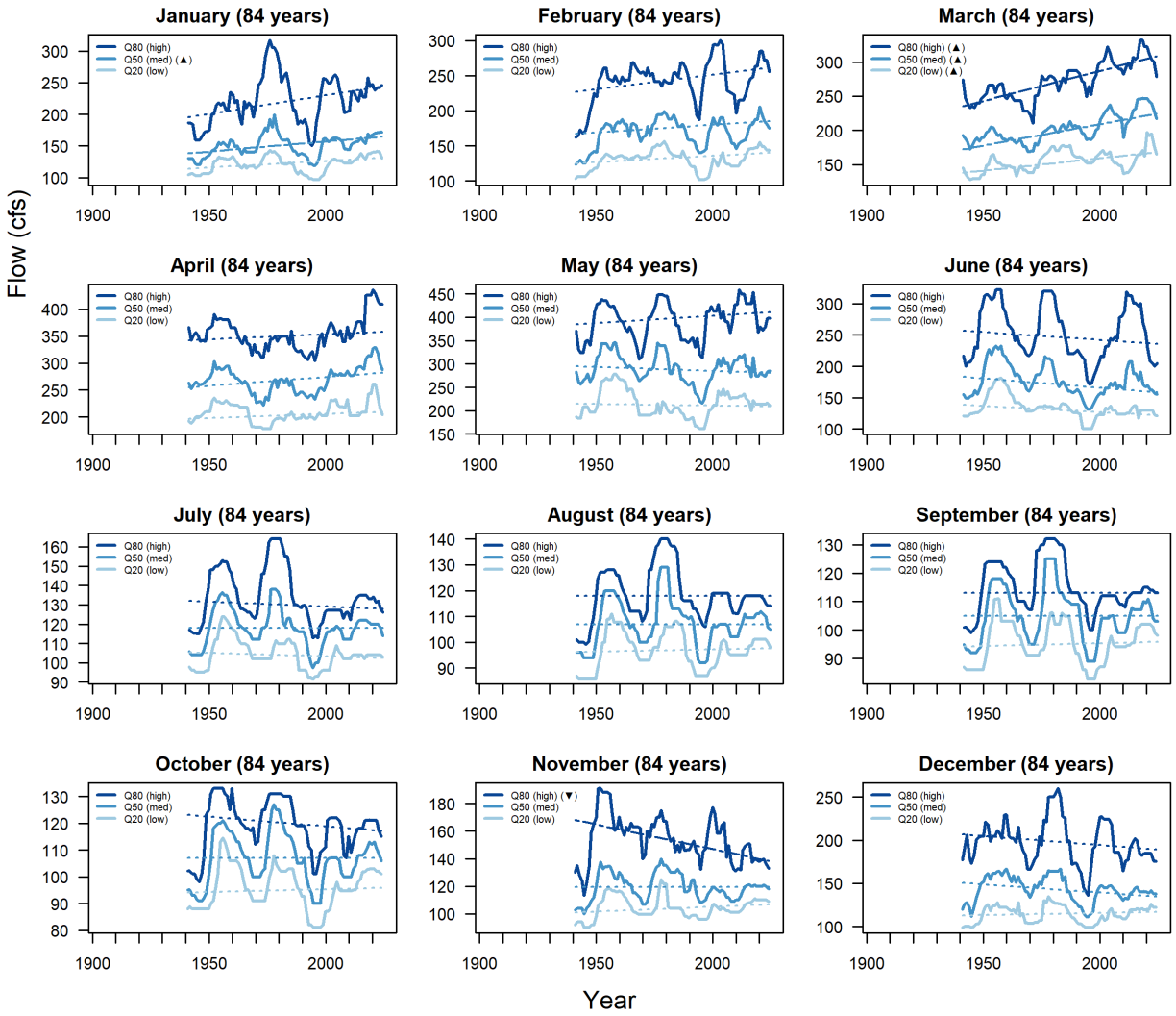
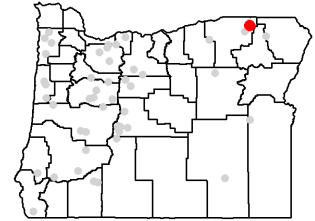


LT Flow Trends for Station #14010000

Annual Flow at Station #14010000 (84 years, 1941-2024)

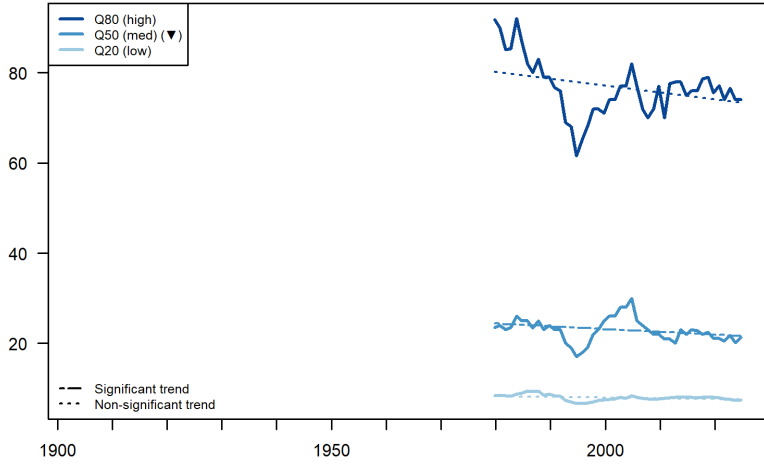


Station #14010000

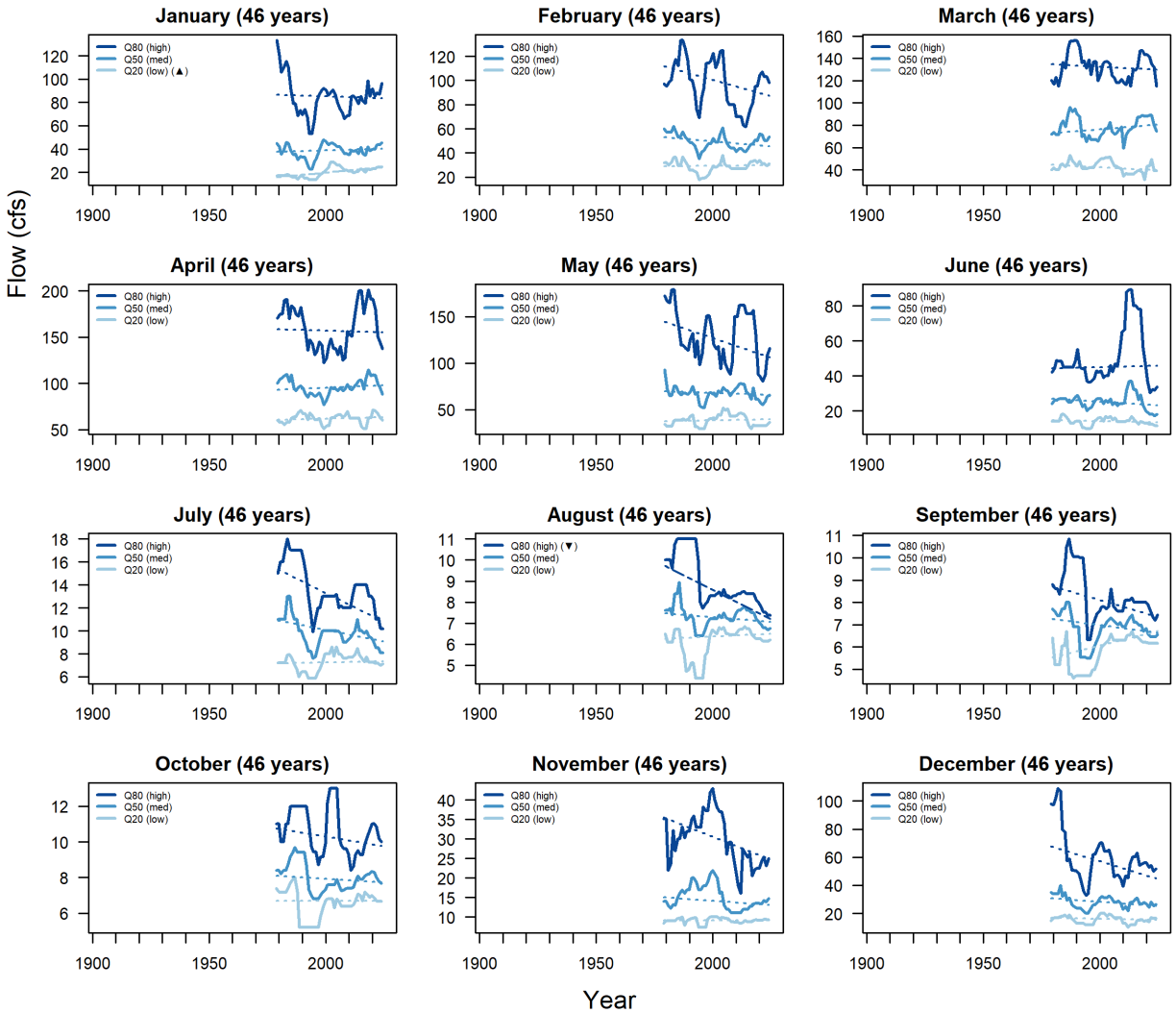
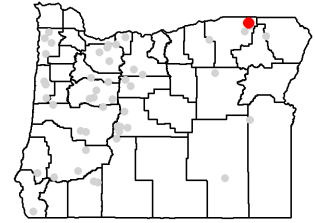


LT Flow Trends for Station #14010800

Annual Flow at Station #14010800 (46 years, 1979-2024)

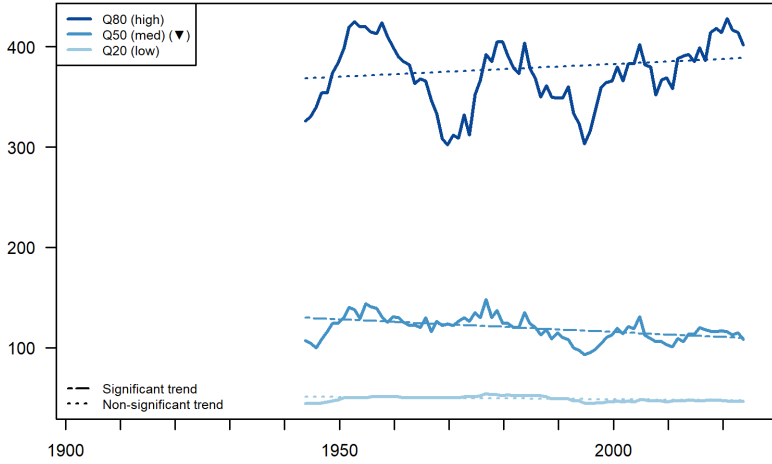


Station #14010800

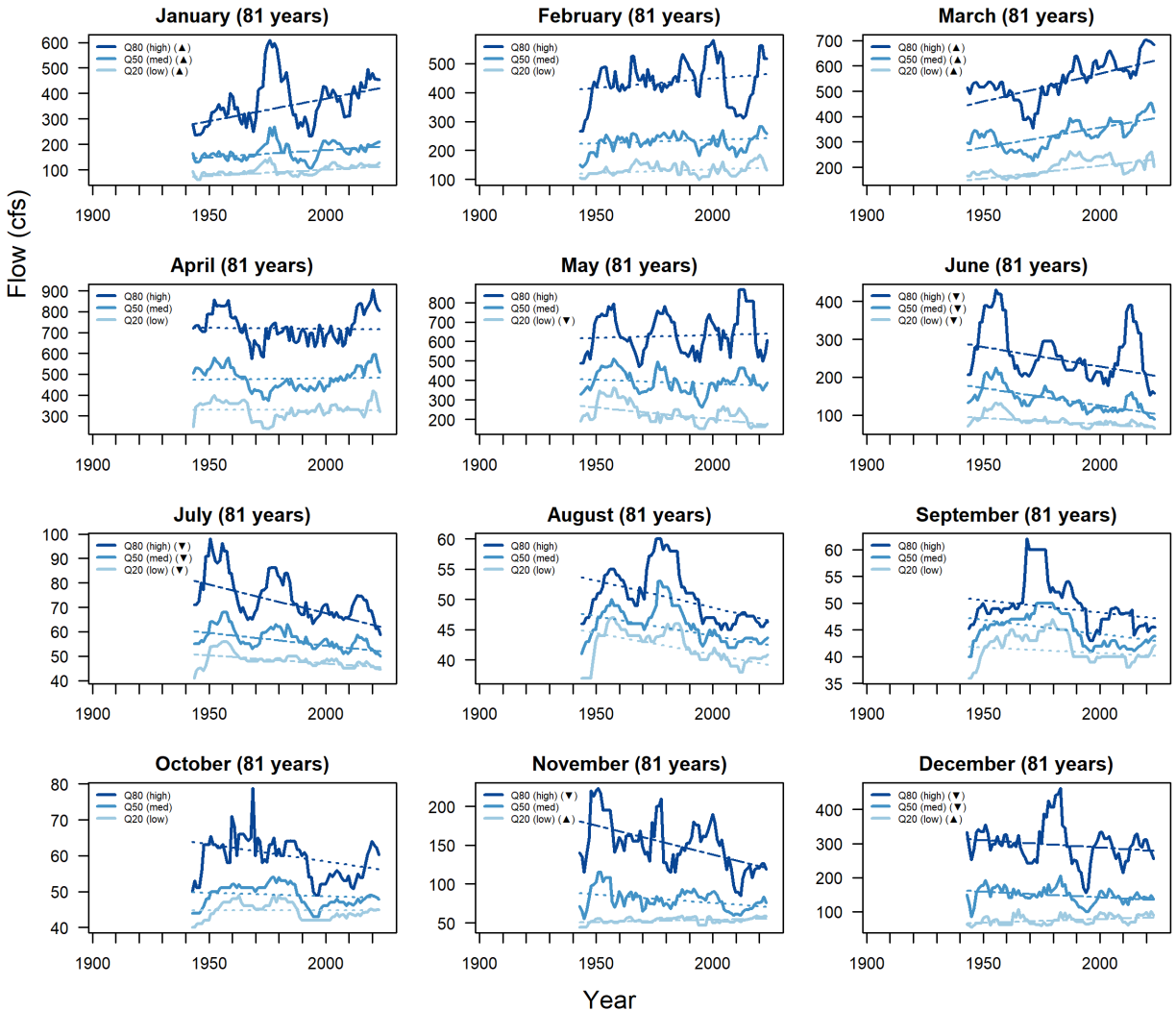
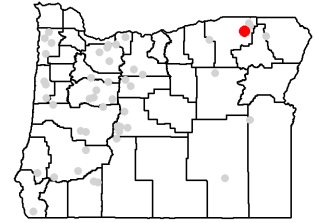


LT Flow Trends for Station #14020000

Annual Flow at Station #14020000 (81 years, 1943-2023)

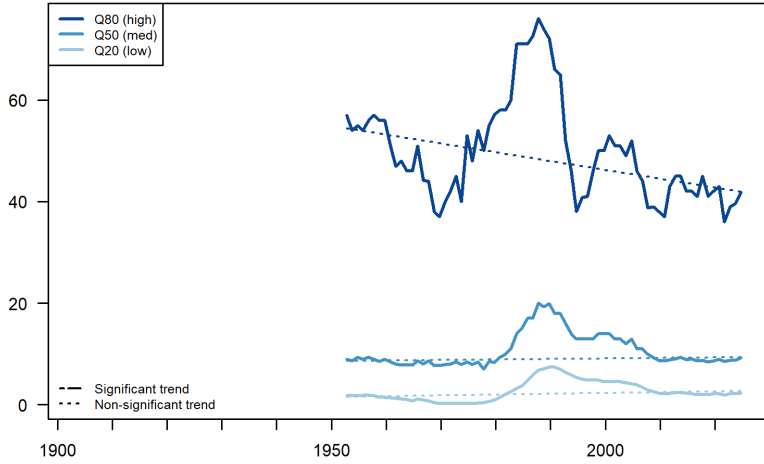


Station #14020000

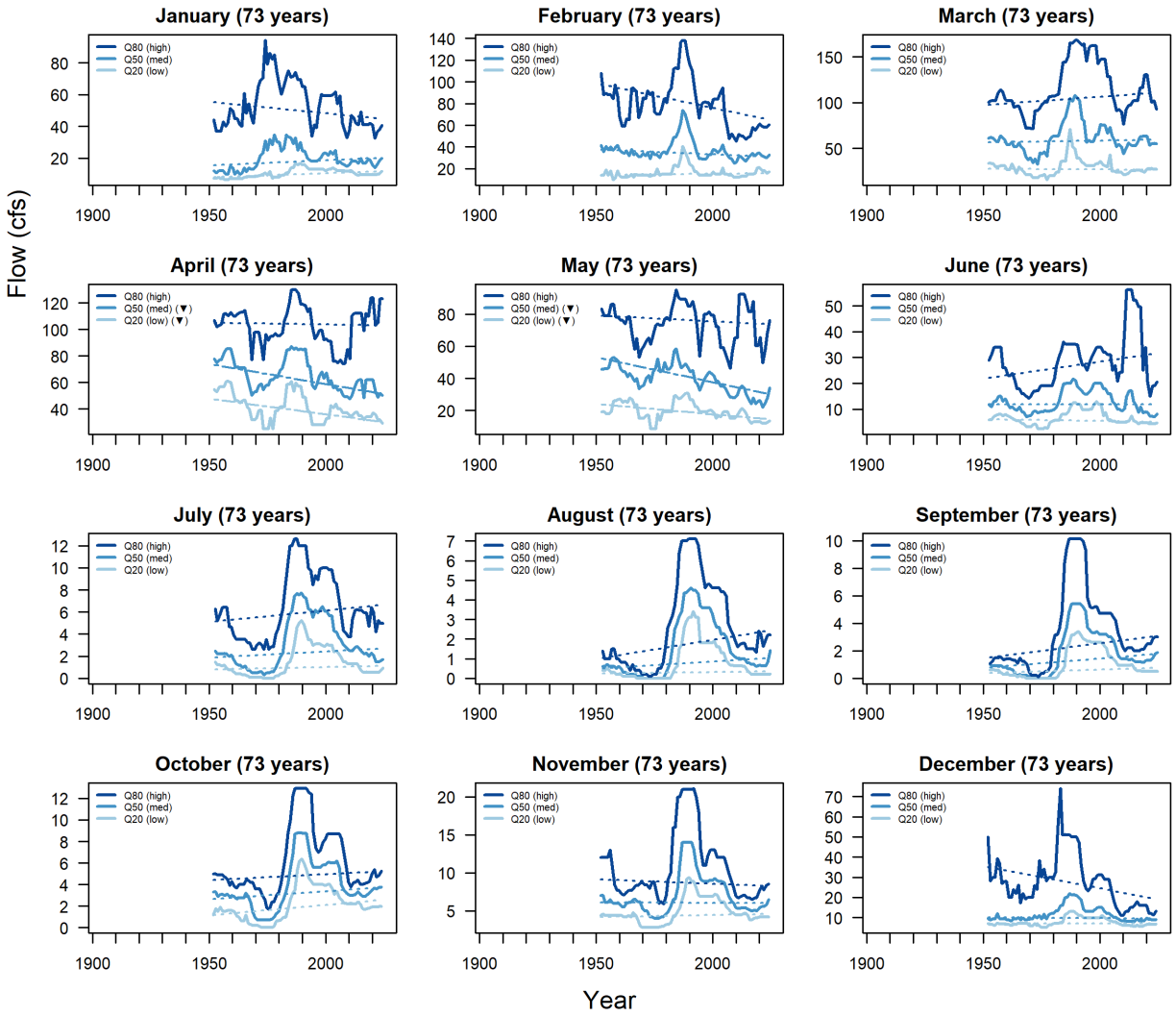
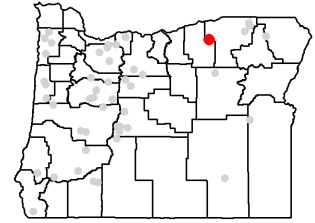


# LT Flow Trends for Station #14032000

## Annual Flow at Station #14032000 (73 years, 1952-2024)

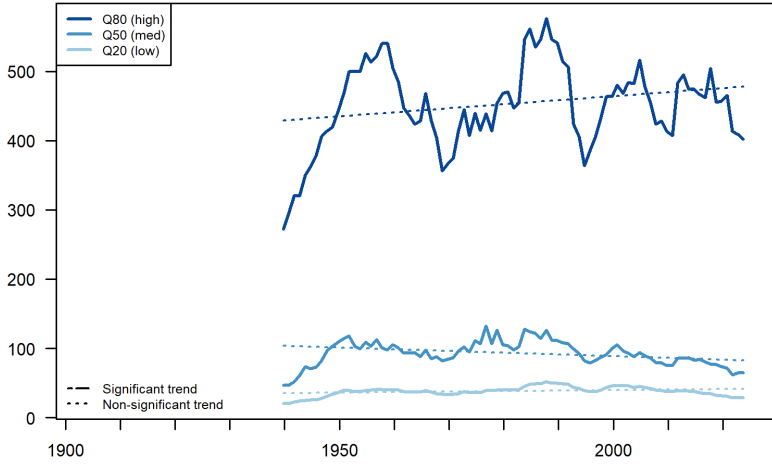


## Station #14032000

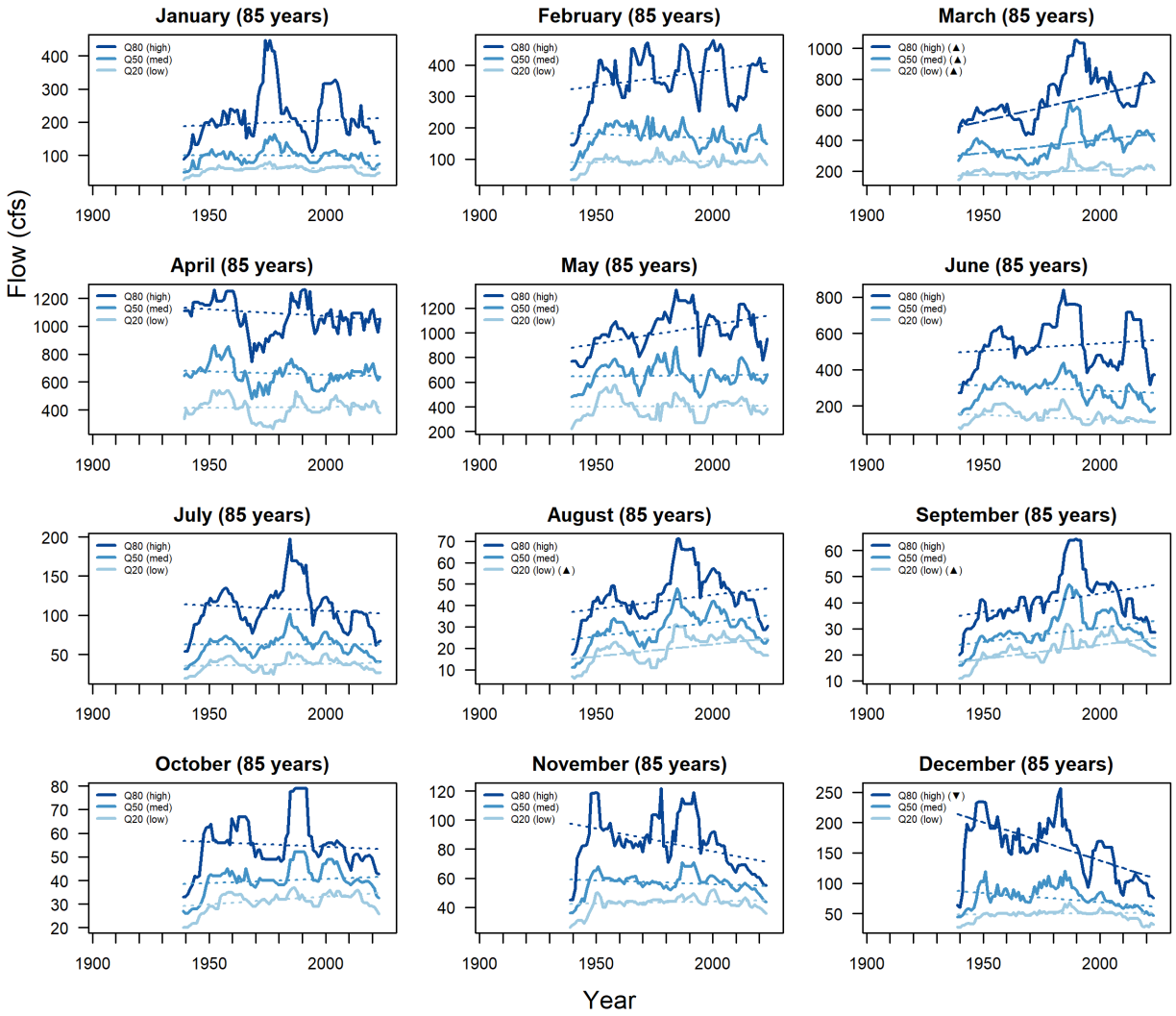
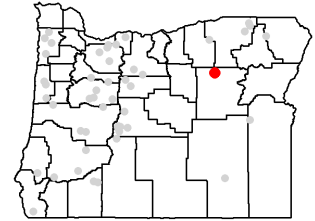


LT Flow Trends for Station #14044000

Annual Flow at Station #14044000 (85 years, 1939-2023)

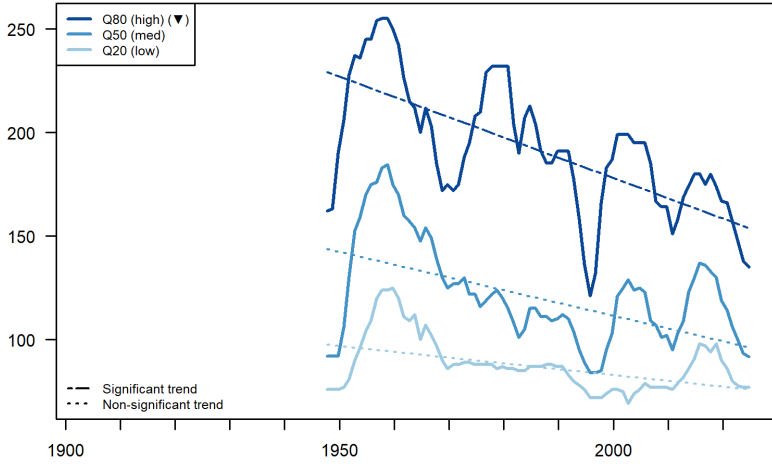


Station #14044000

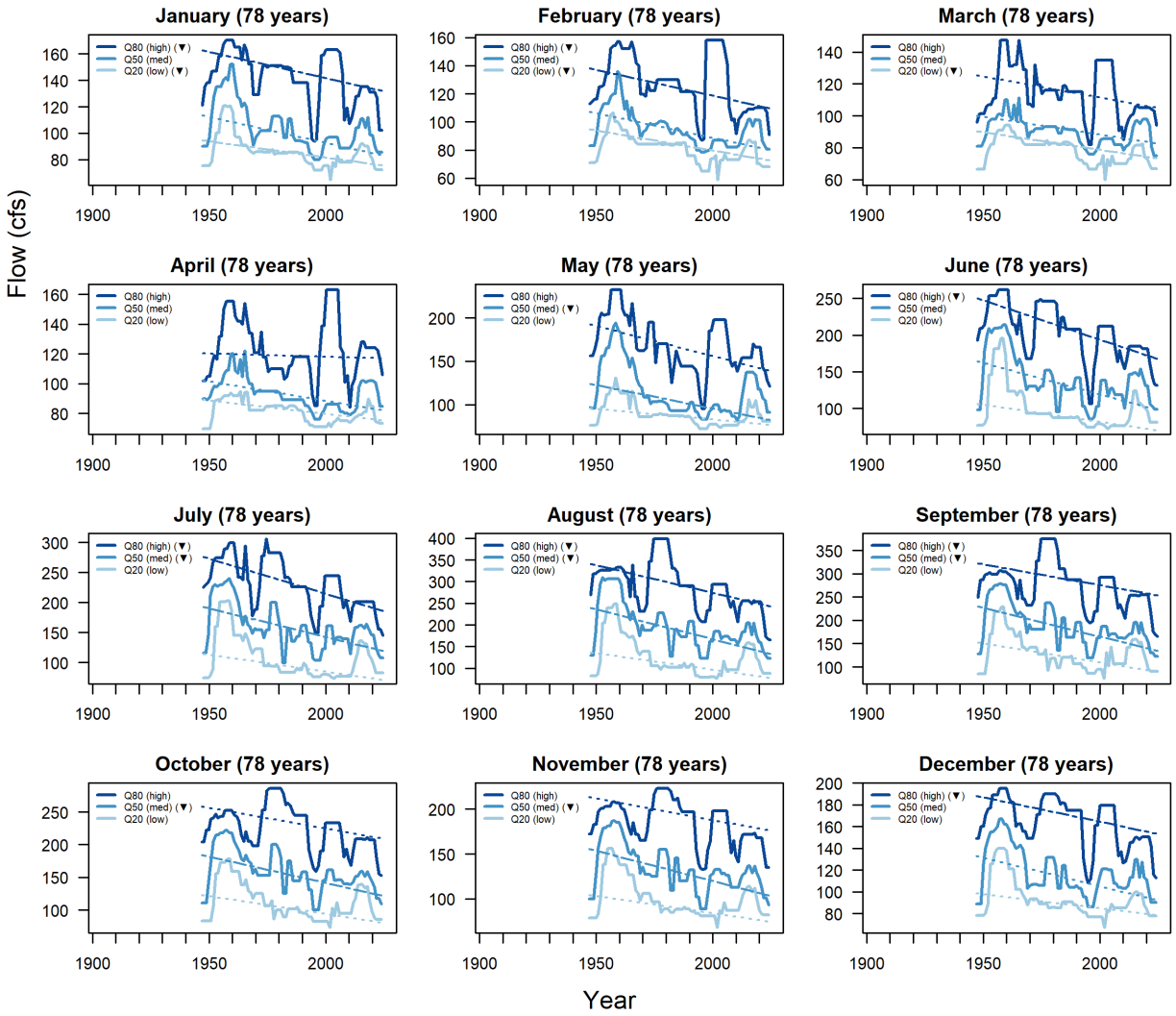
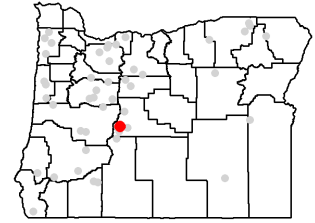


LT Flow Trends for Station #14050000

Annual Flow at Station #14050000 (78 years, 1947-2024)

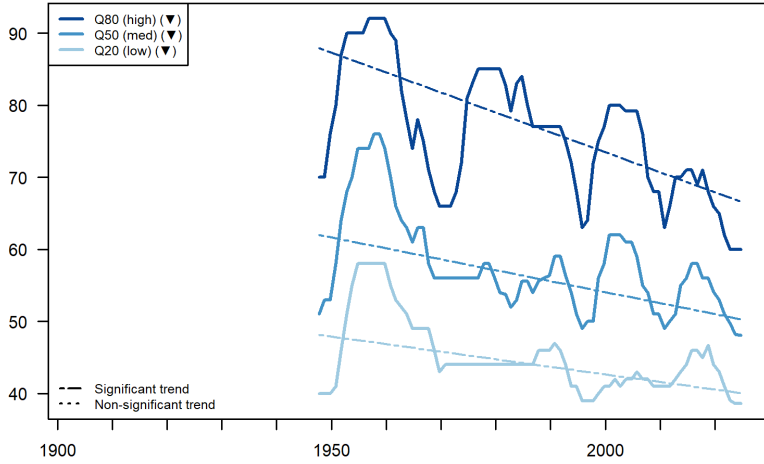


Station #14050000

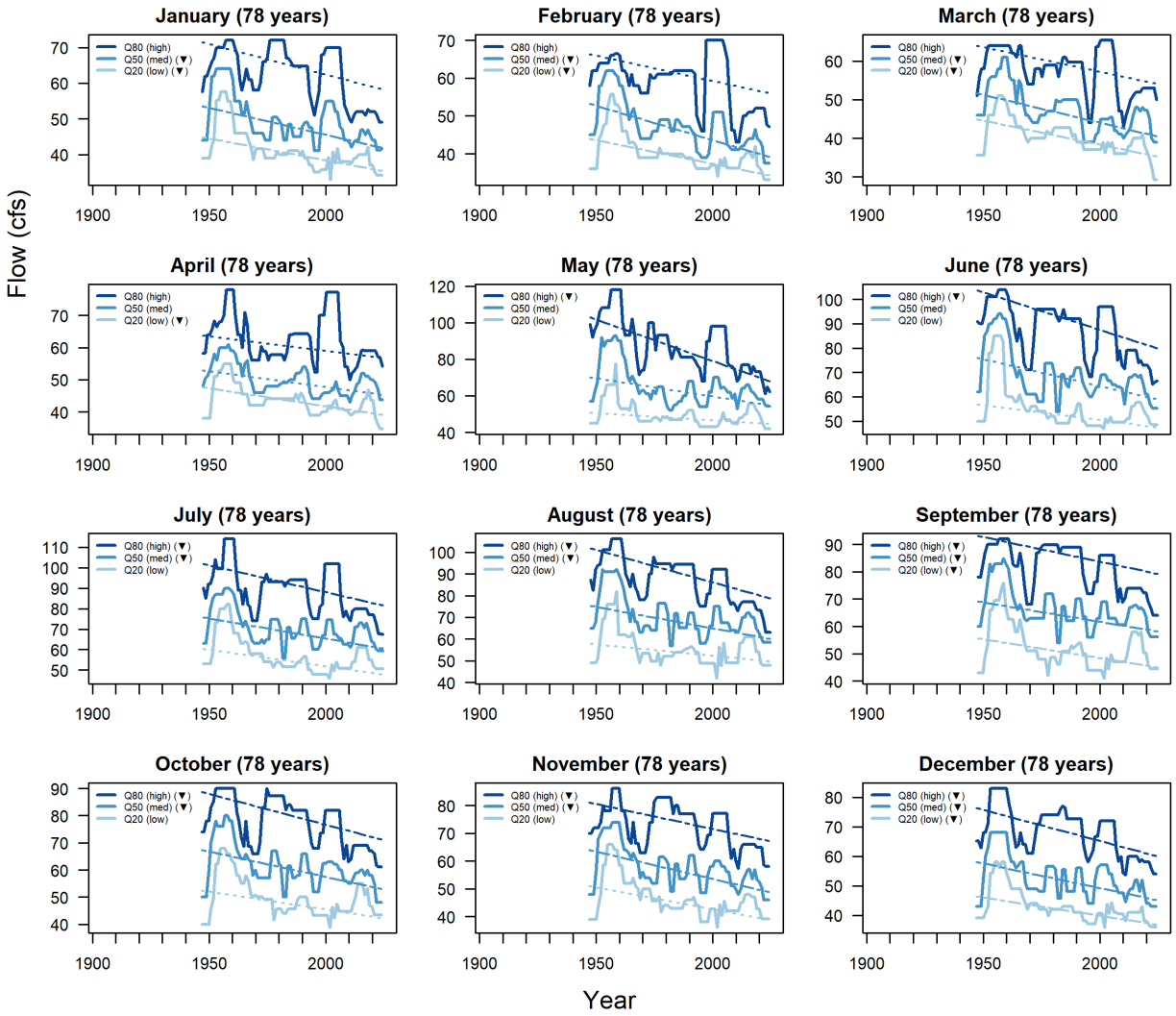
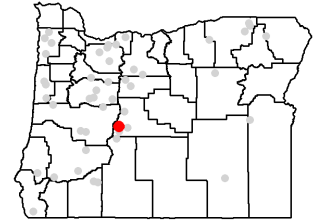


LT Flow Trends for Station #14050500

Annual Flow at Station #14050500 (78 years, 1947-2024)

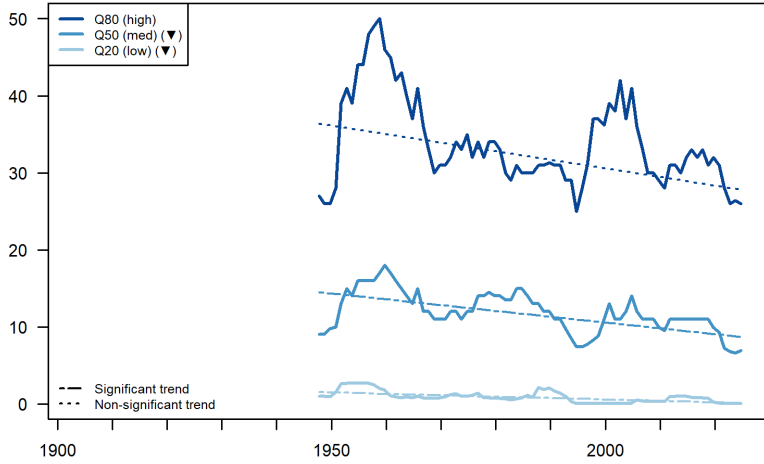


Station #14050500

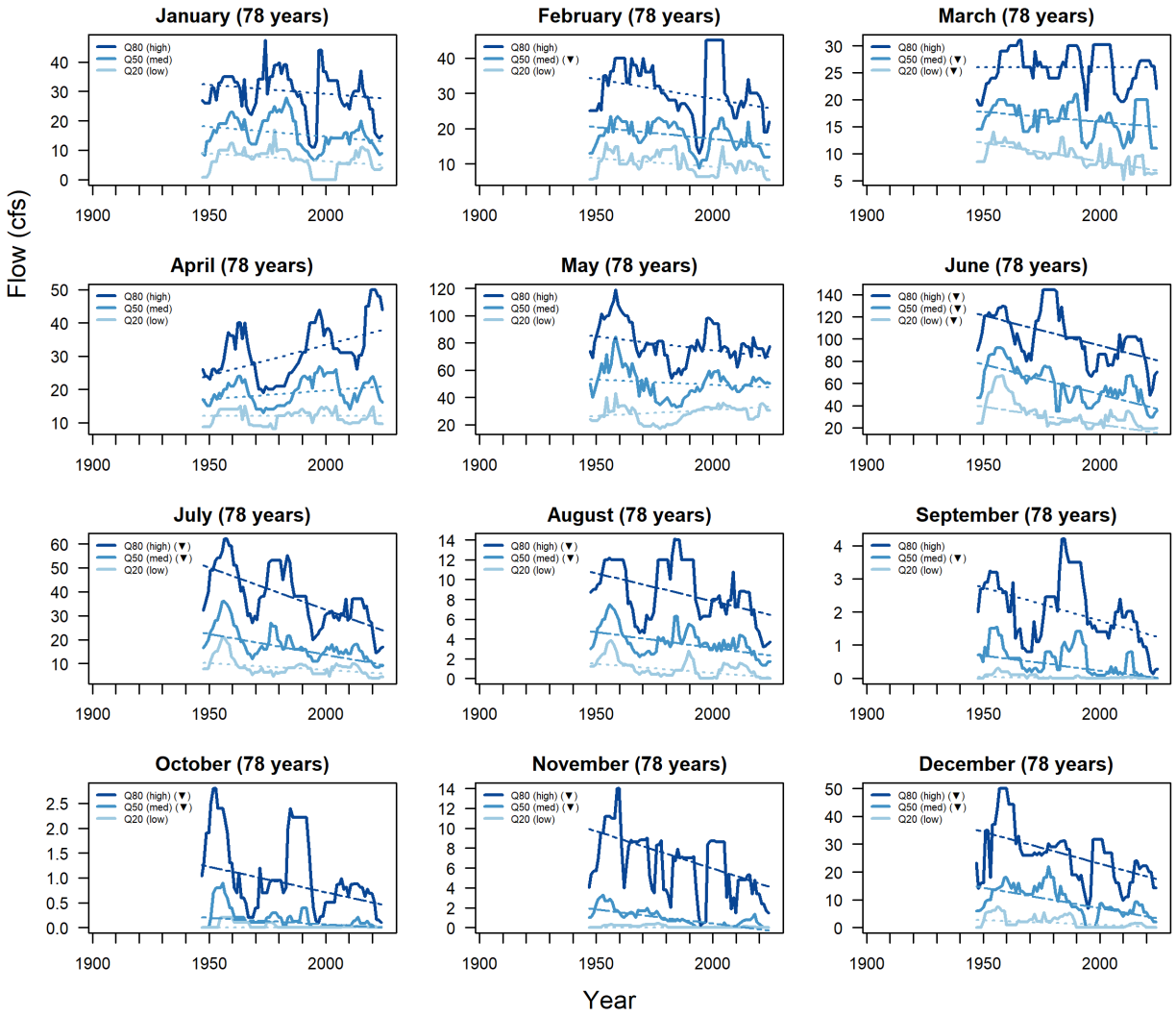
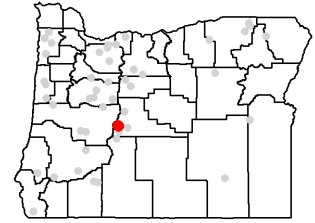


LT Flow Trends for Station #14051000

Annual Flow at Station #14051000 (78 years, 1947-2024)

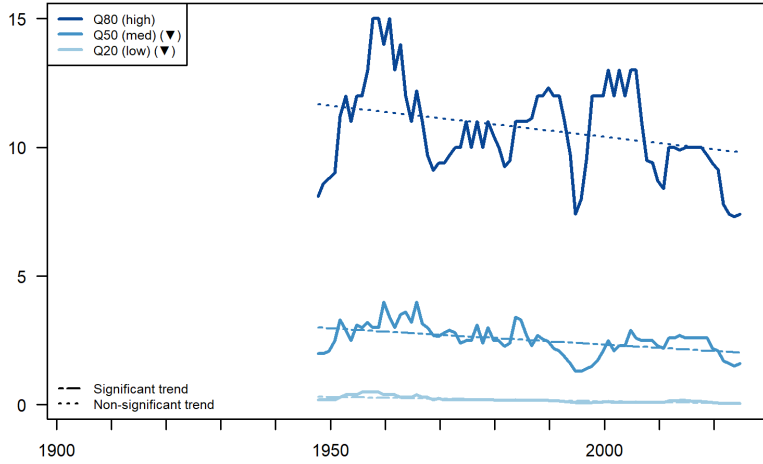


Station #14051000

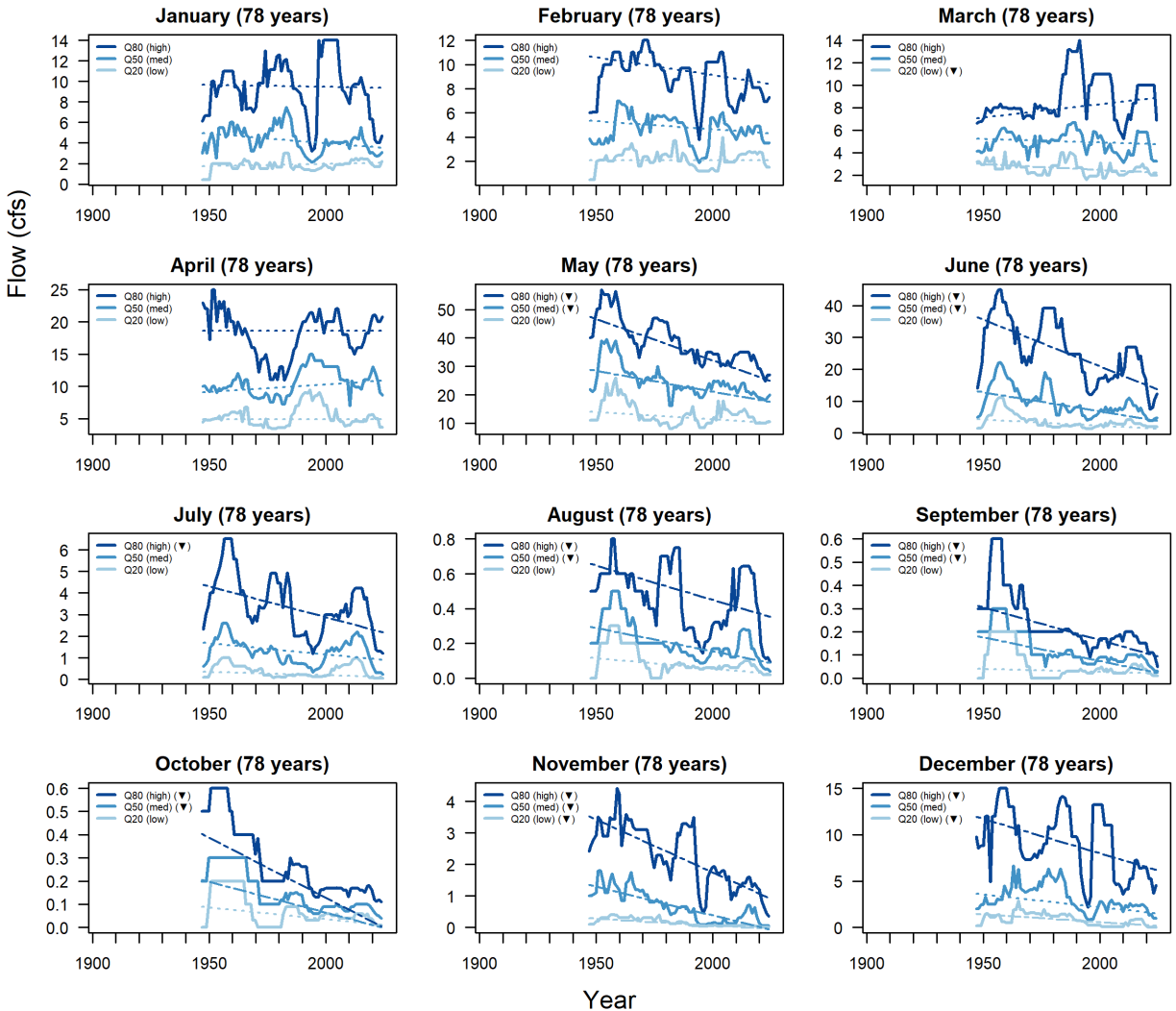
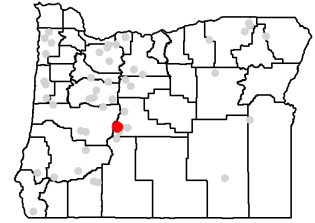


LT Flow Trends for Station #14052000

Annual Flow at Station #14052000 (78 years, 1947-2024)

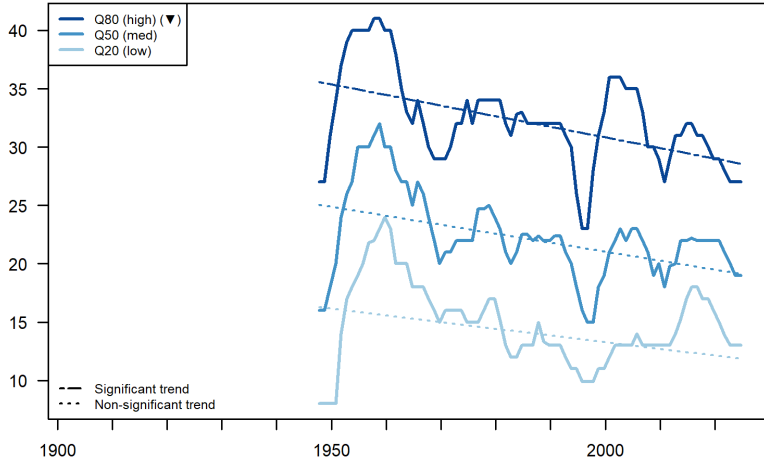


Station #14052000

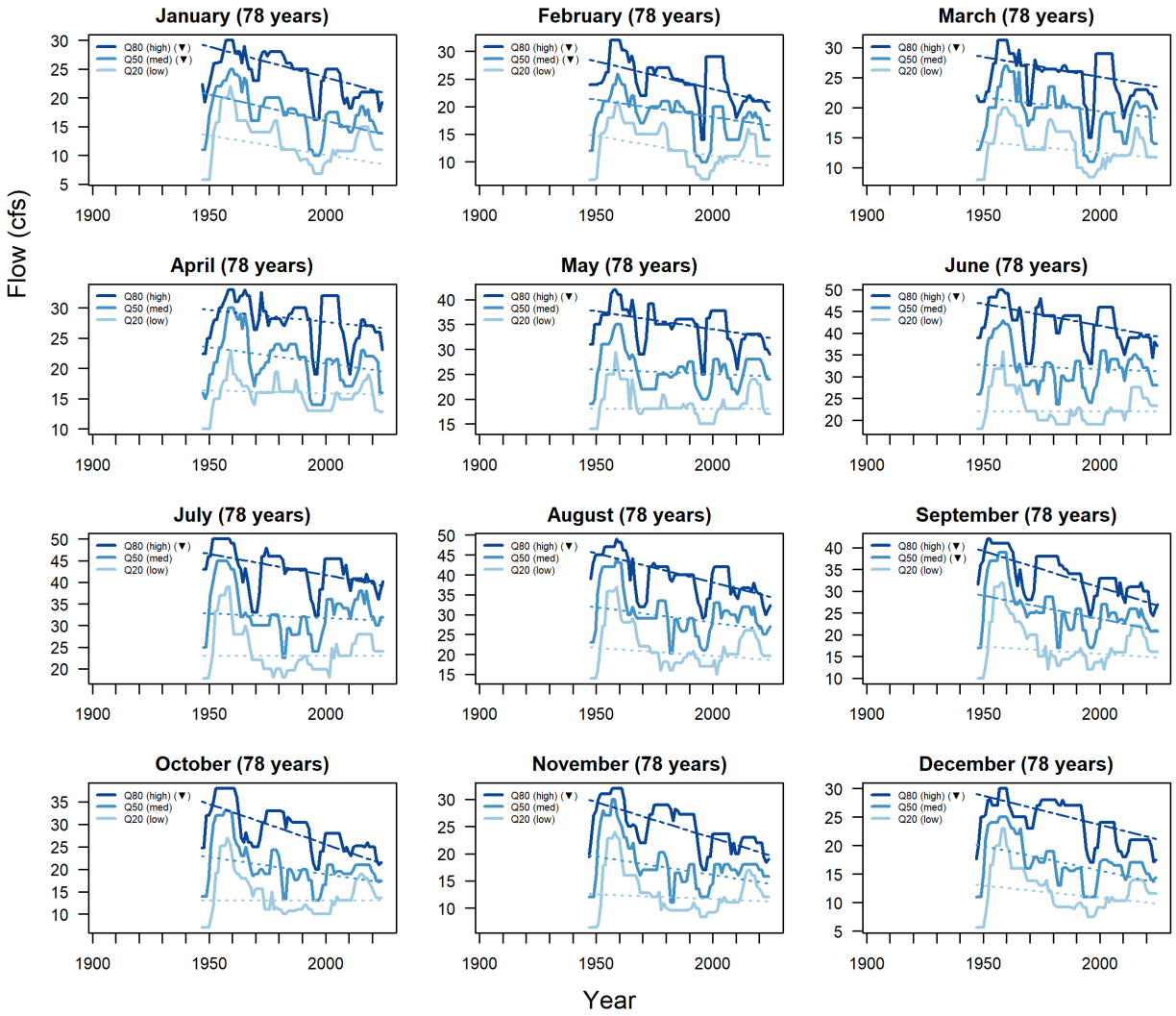
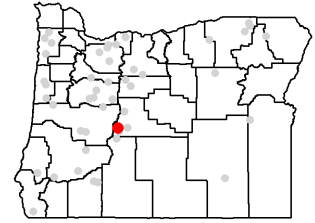


# LT Flow Trends for Station #14052500

## Annual Flow at Station #14052500 (78 years, 1947-2024)

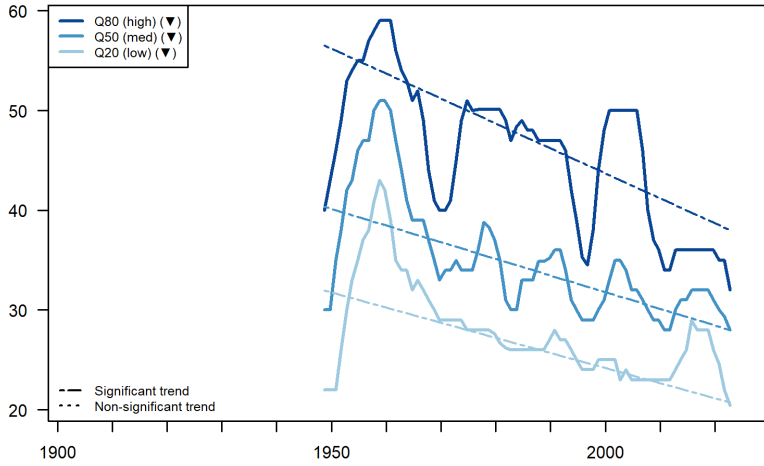


## Station #14052500

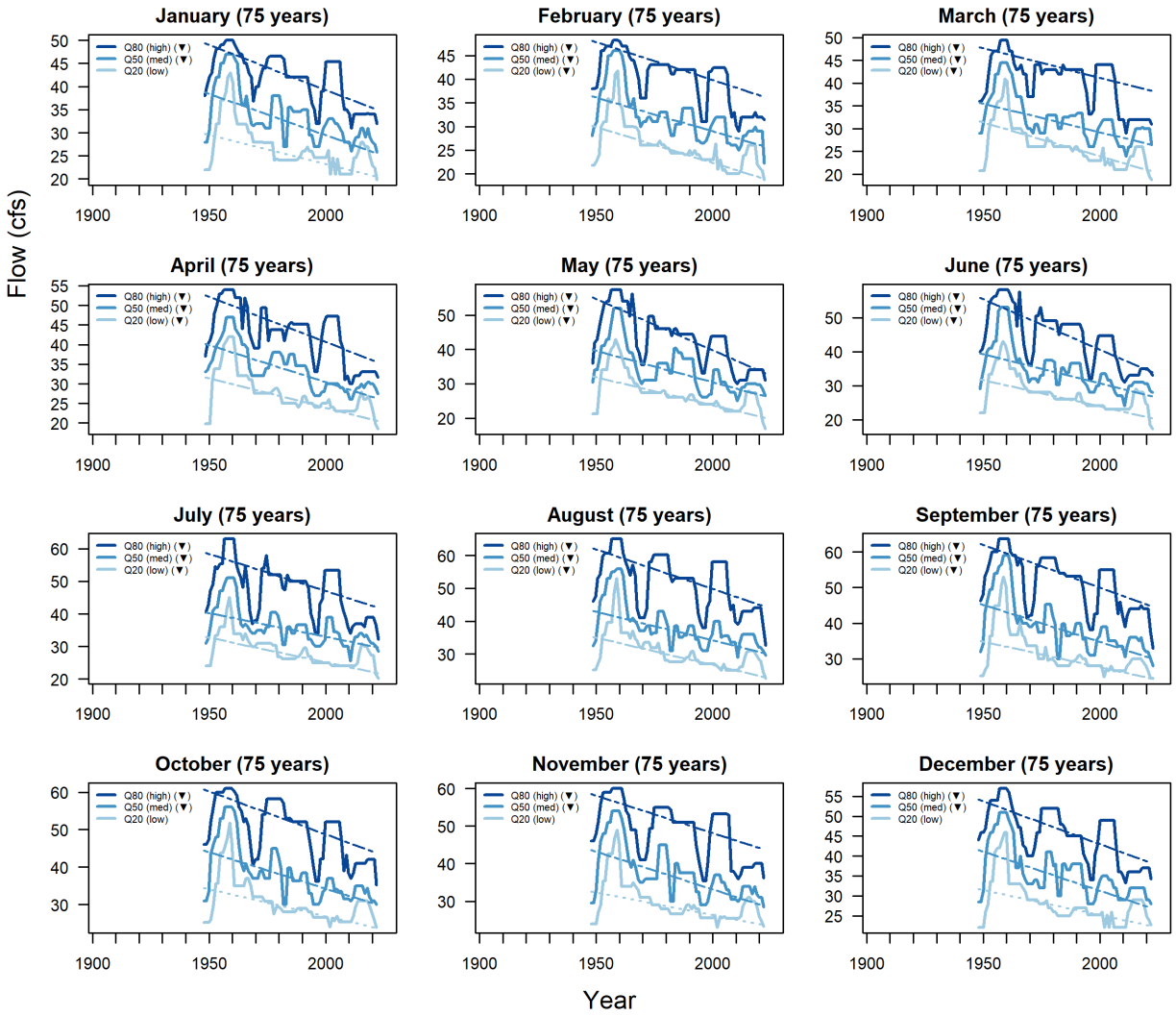
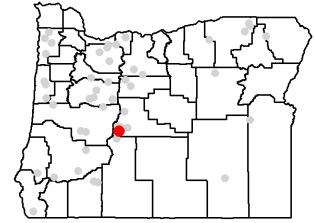


LT Flow Trends for Station #14054500

Annual Flow at Station #14054500 (75 years, 1948-2022)

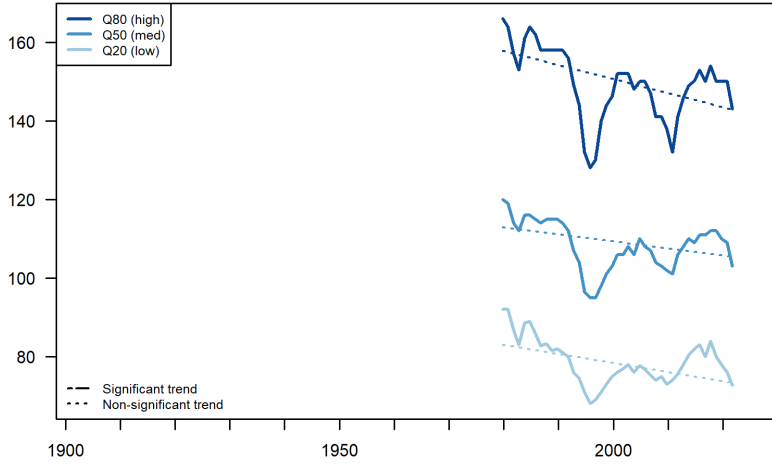


Station #14054500

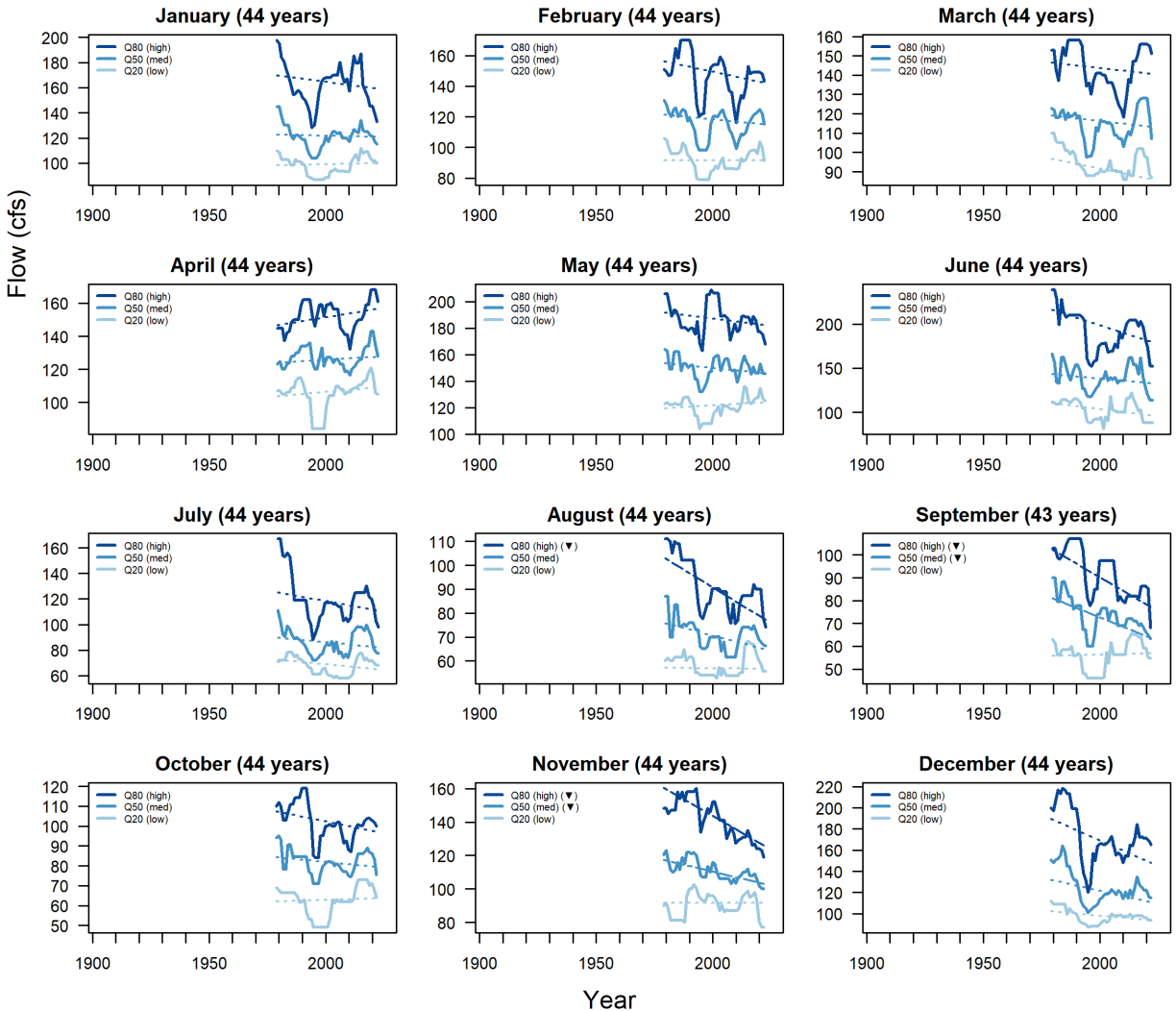
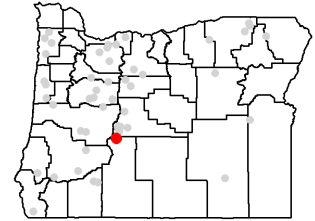


LT Flow Trends for Station #14055600

Annual Flow at Station #14055600 (43 years, 1979-2021)

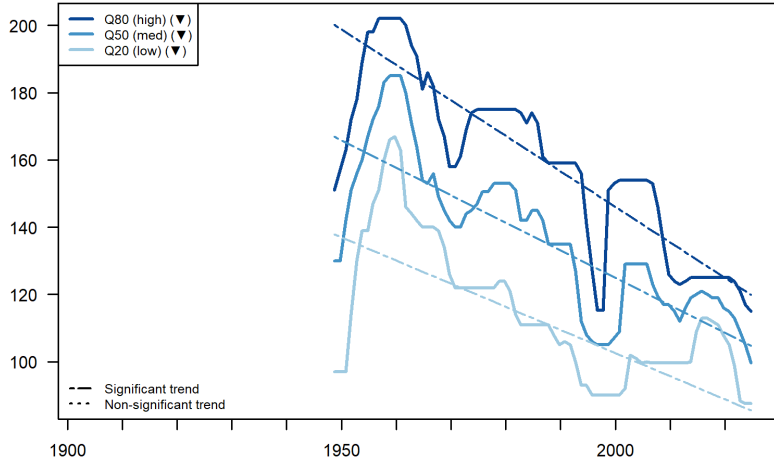


Station #14055600

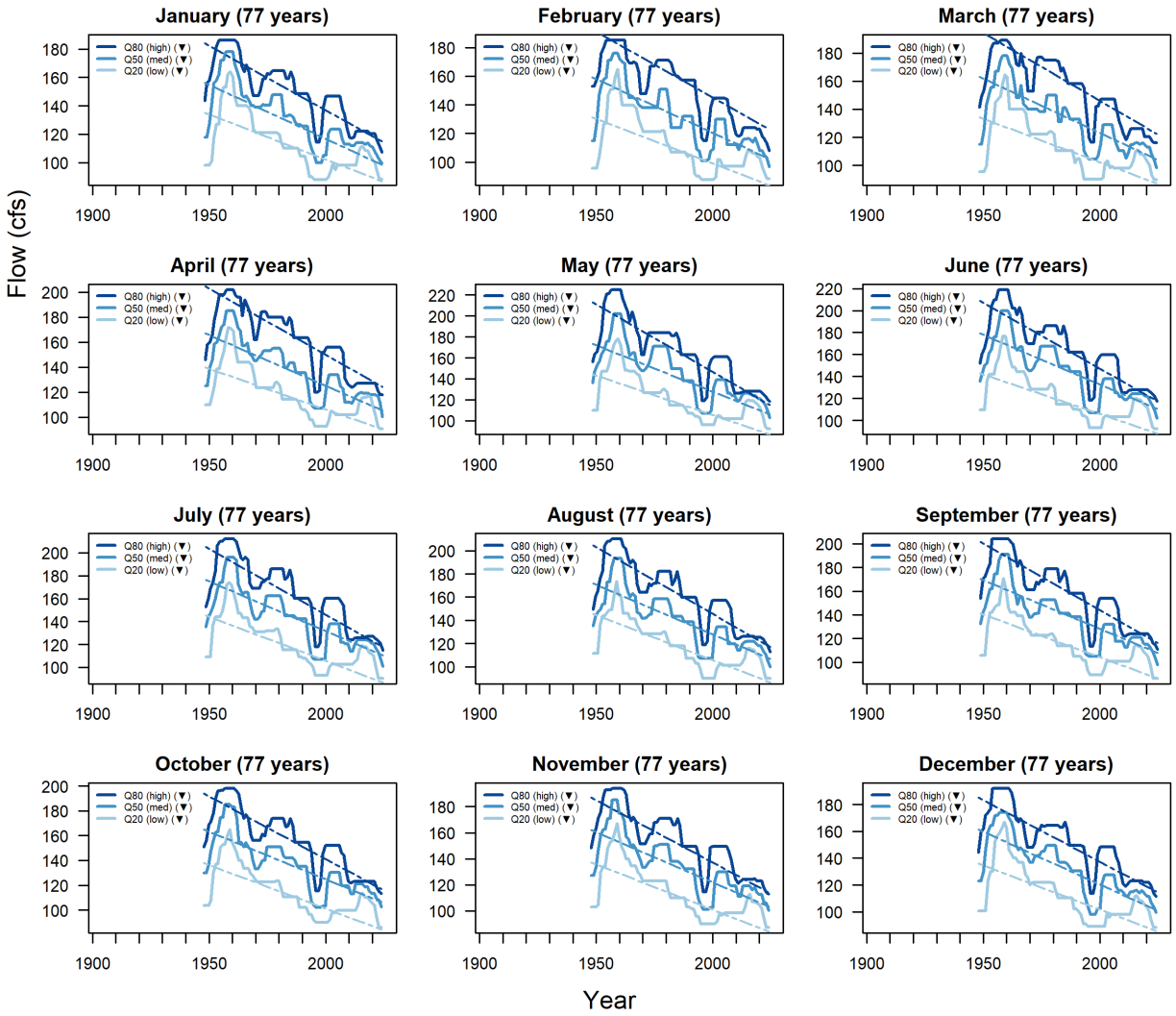
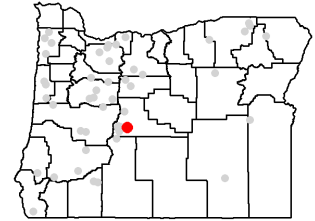


LT Flow Trends for Station #14057500

Annual Flow at Station #14057500 (77 years, 1948-2024)

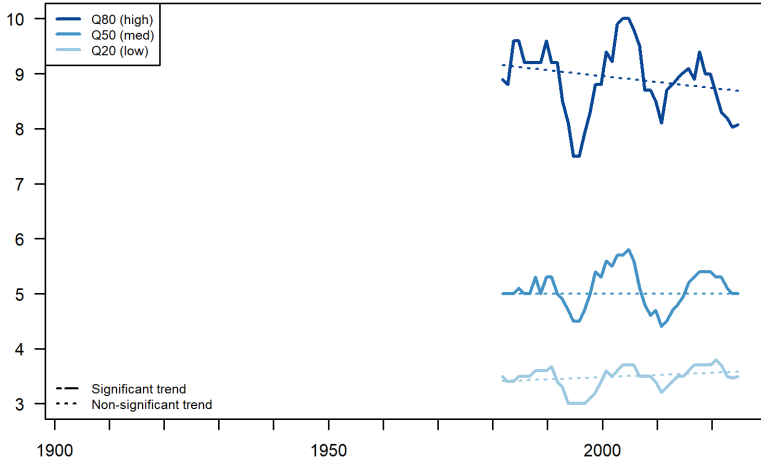


Station #14057500

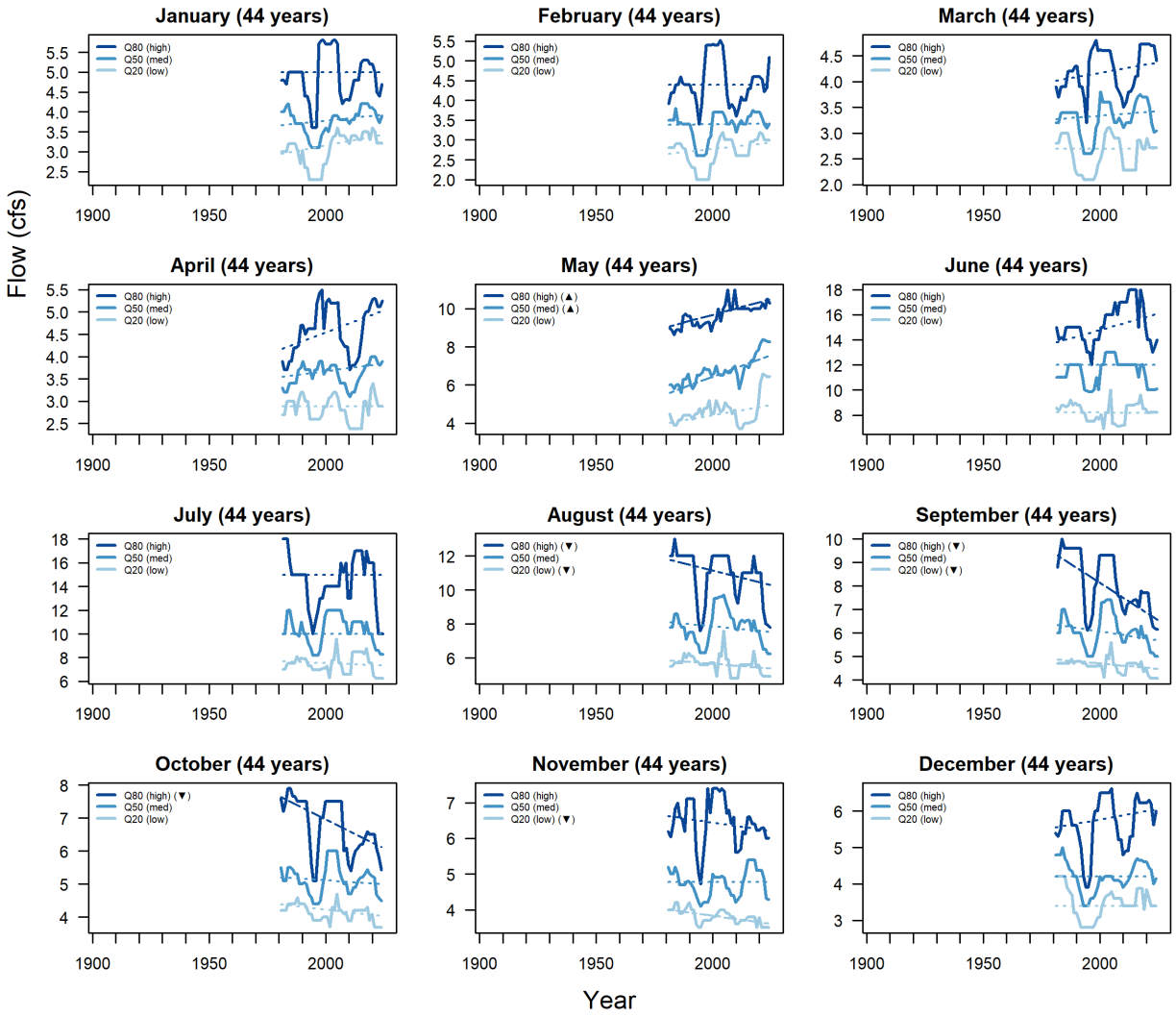
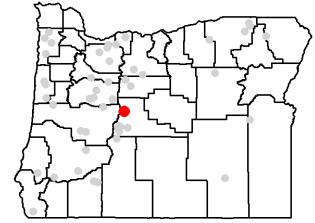


LT Flow Trends for Station #14074900

Annual Flow at Station #14074900 (44 years, 1981-2024)

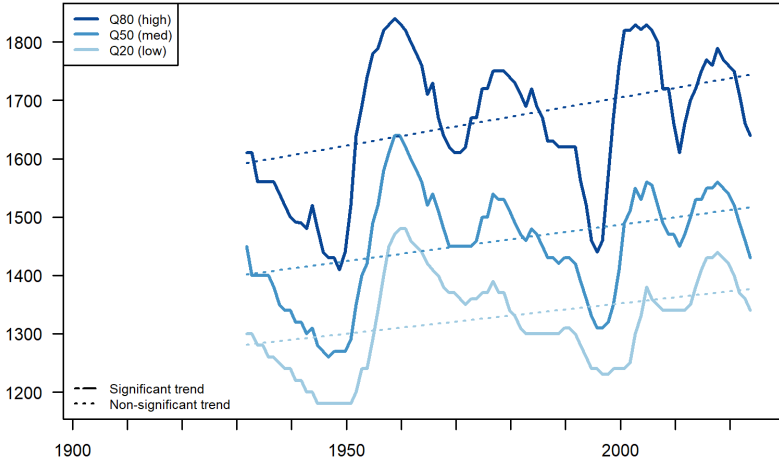


Station #14074900

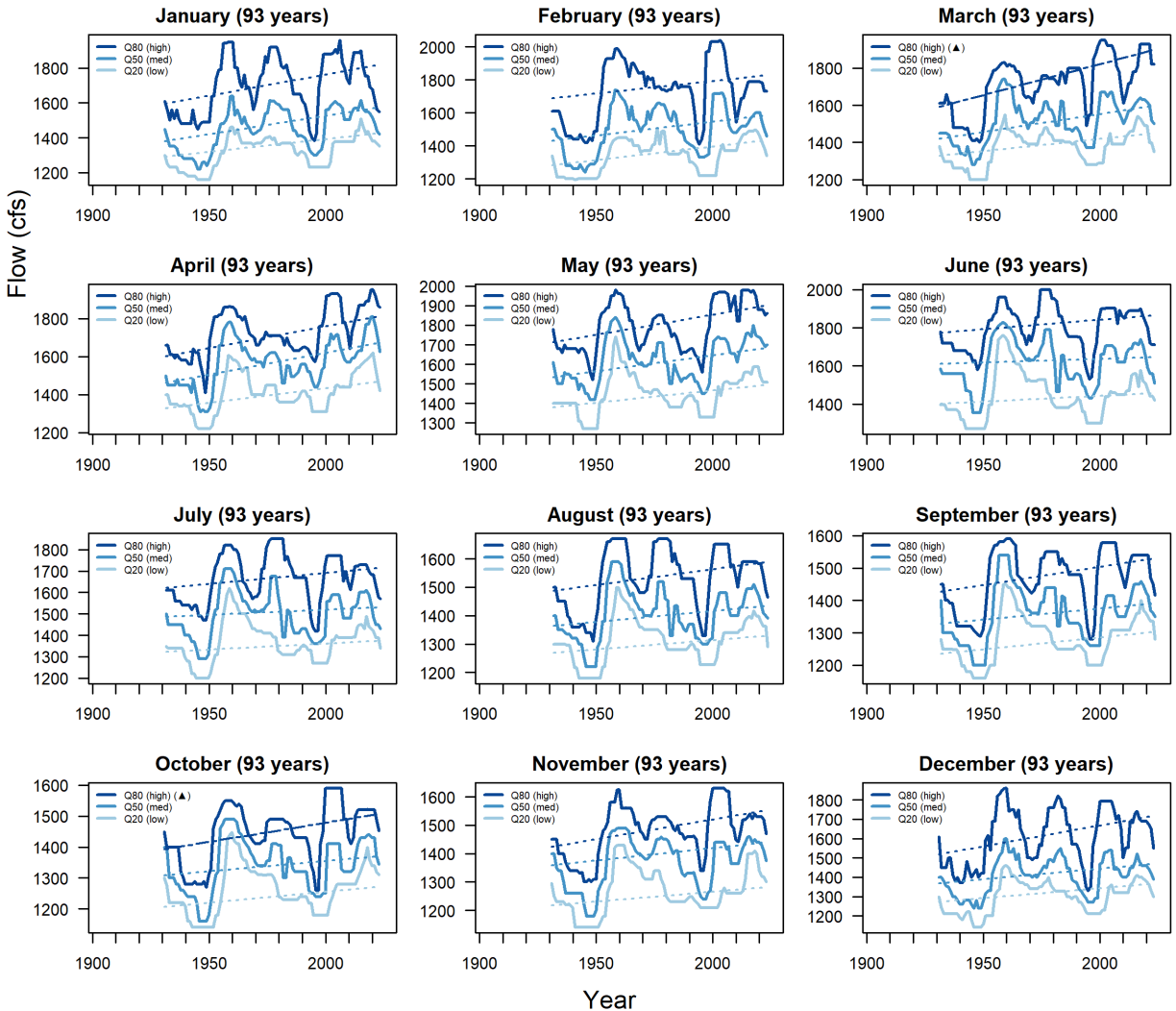
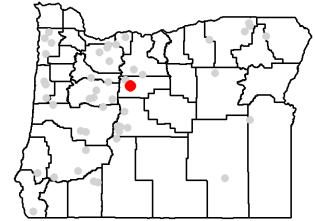


LT Flow Trends for Station #14091500

Annual Flow at Station #14091500 (93 years, 1931-2023)

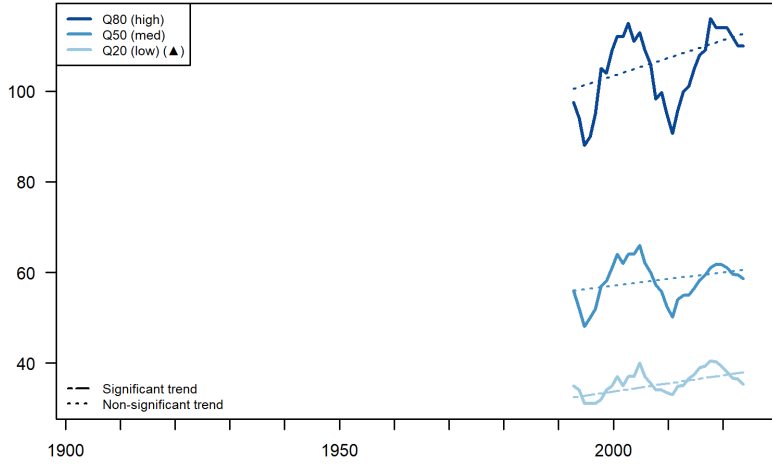


Station #14091500

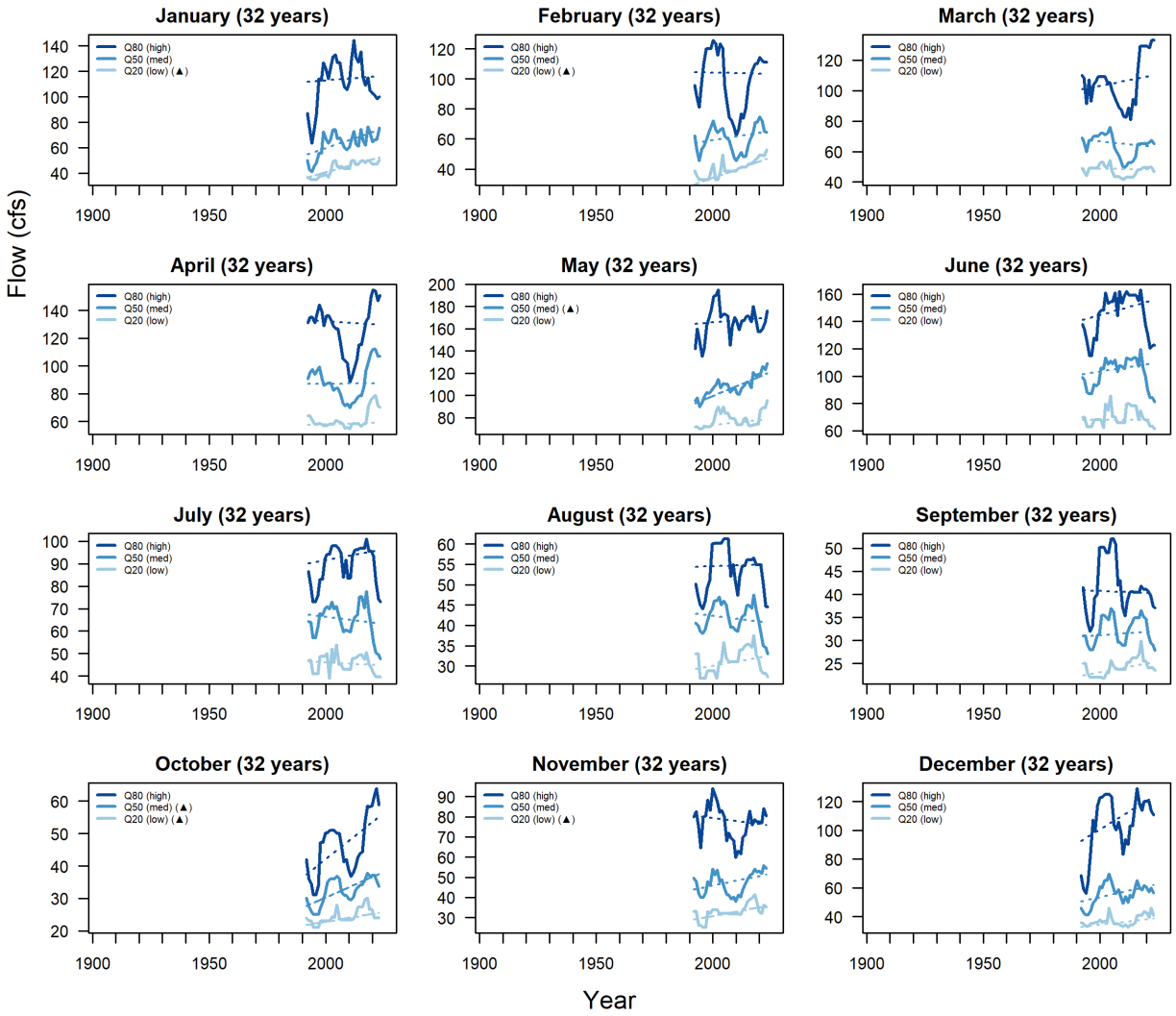
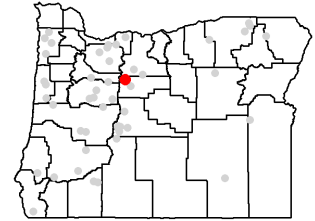


LT Flow Trends for Station #14092750

Annual Flow at Station #14092750 (32 years, 1992-2023)

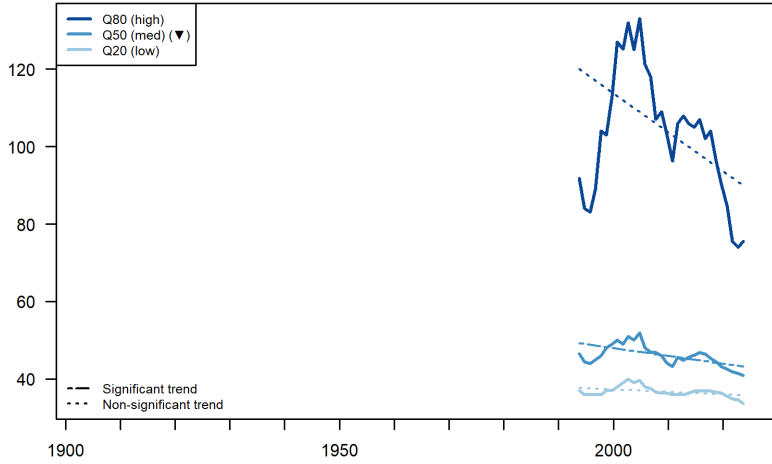


Station #14092750

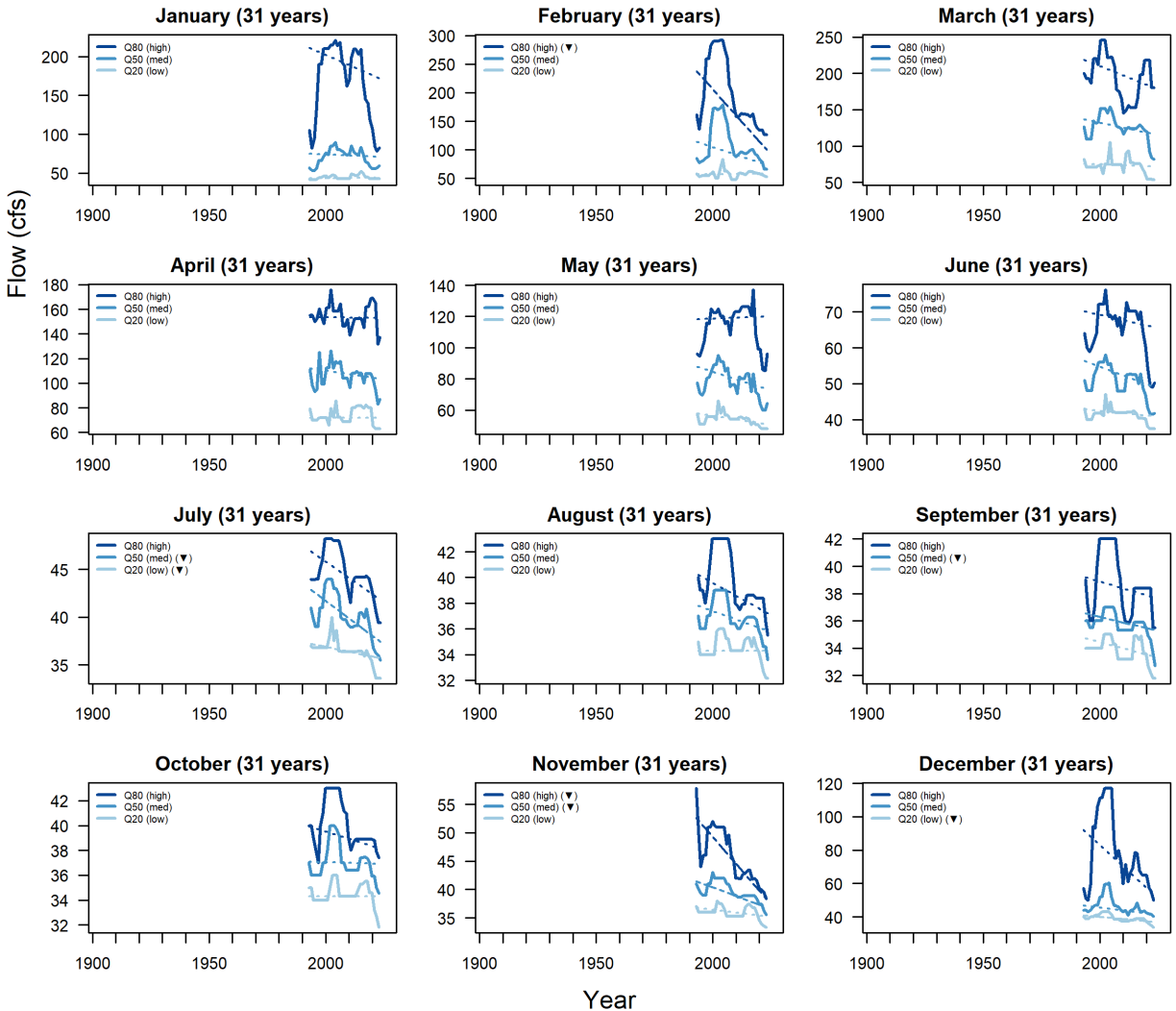
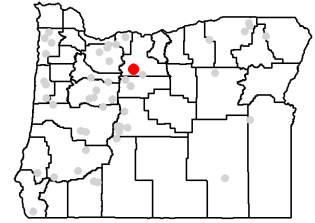


LT Flow Trends for Station #14096850

Annual Flow at Station #14096850 (31 years, 1993-2023)

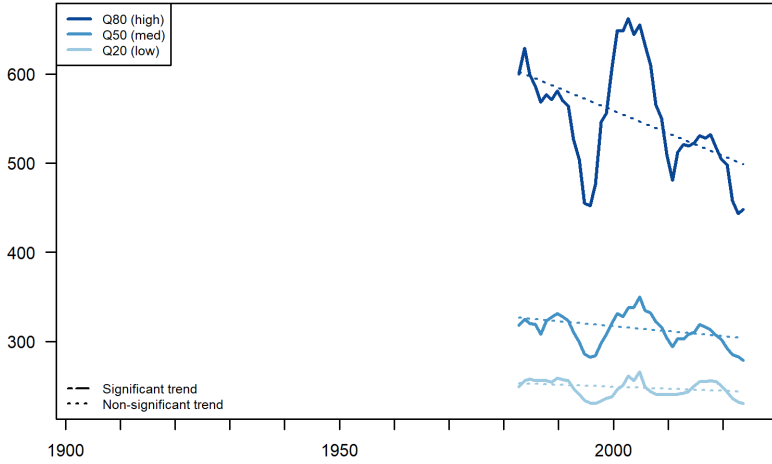


Station #14096850

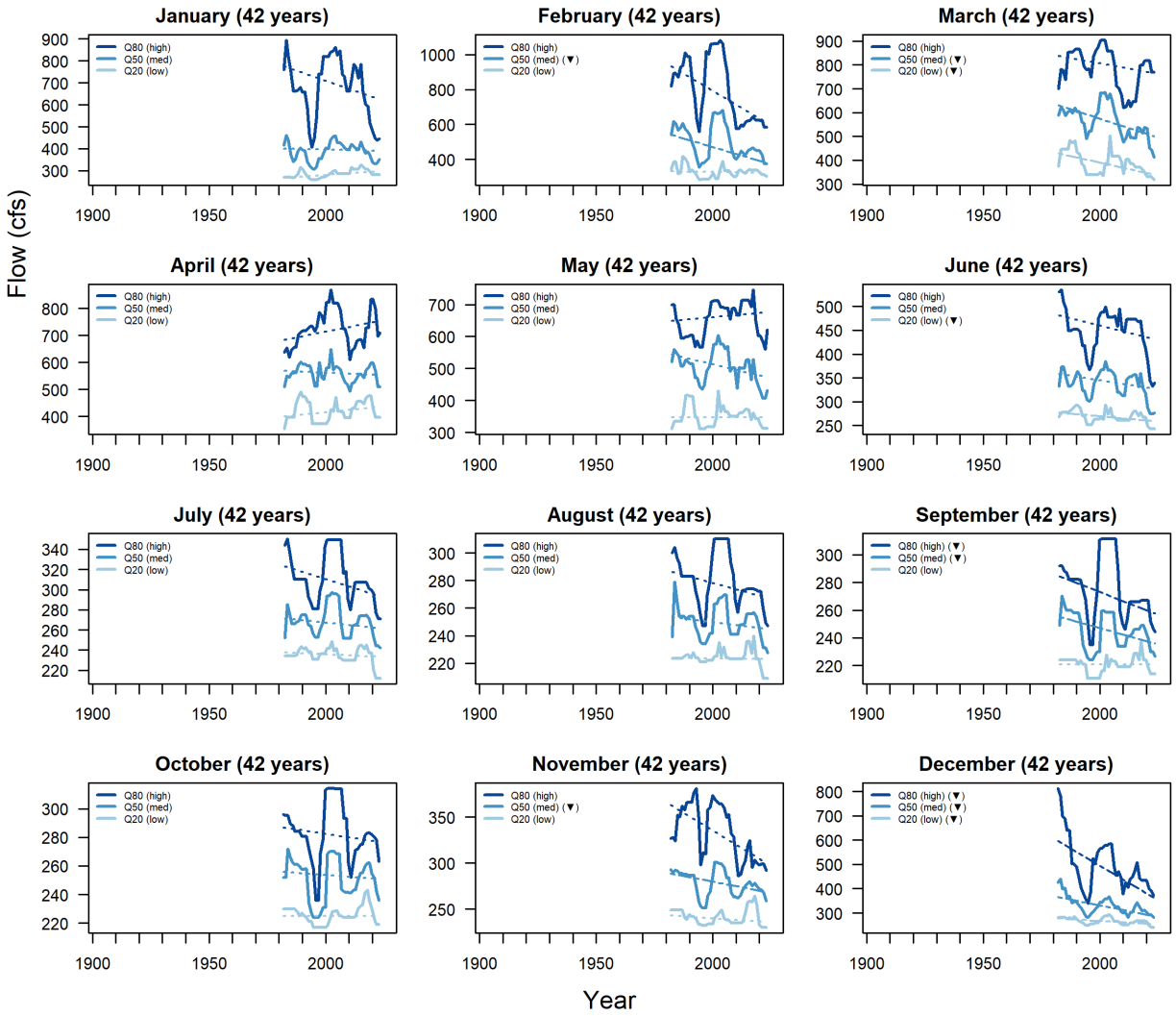
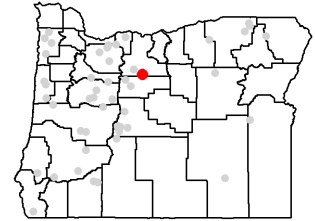


LT Flow Trends for Station #14097100

Annual Flow at Station #14097100 (42 years, 1982-2023)

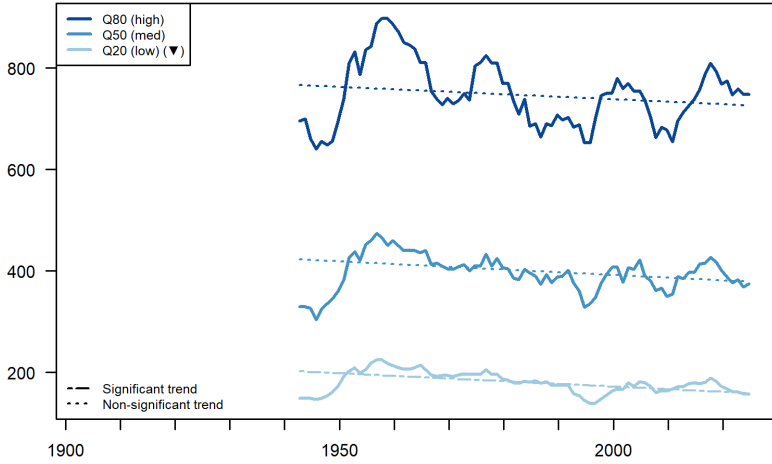


Station #14097100

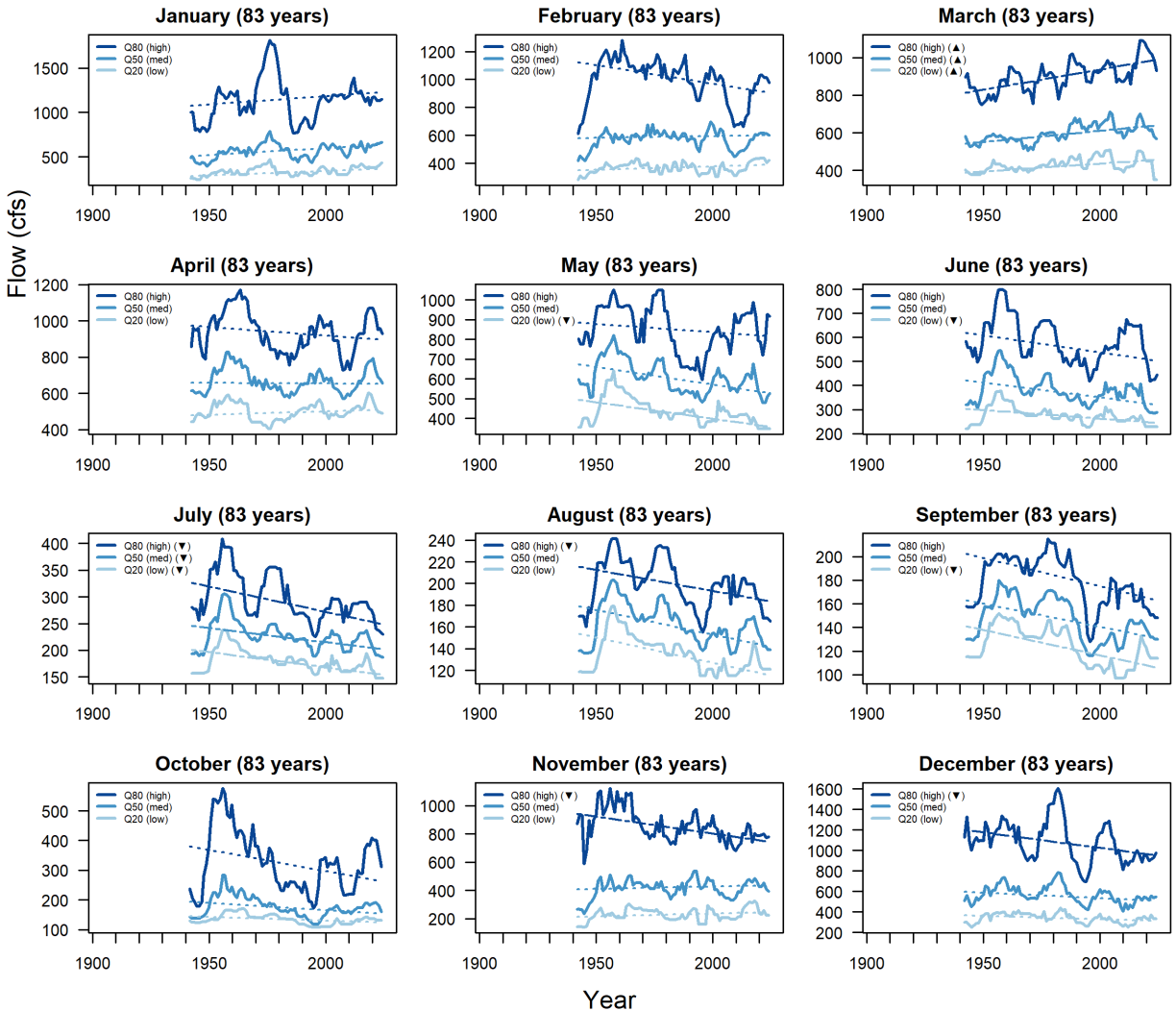
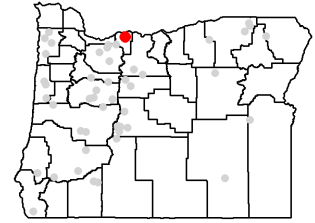


LT Flow Trends for Station #14118500

Annual Flow at Station #14118500 (83 years, 1942-2024)

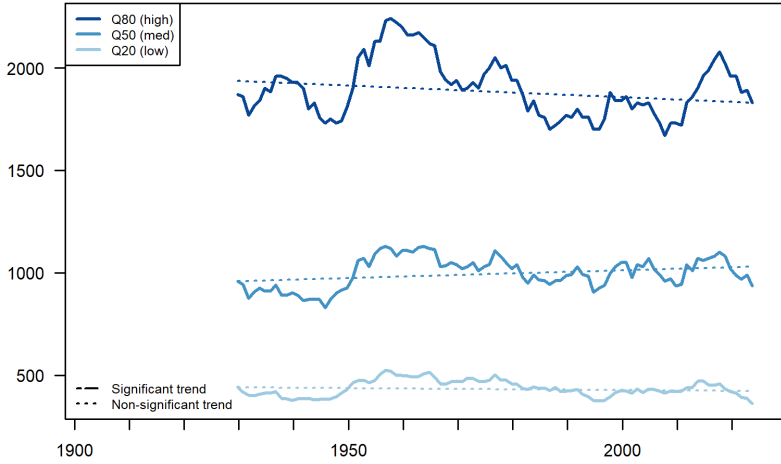


Station #14118500

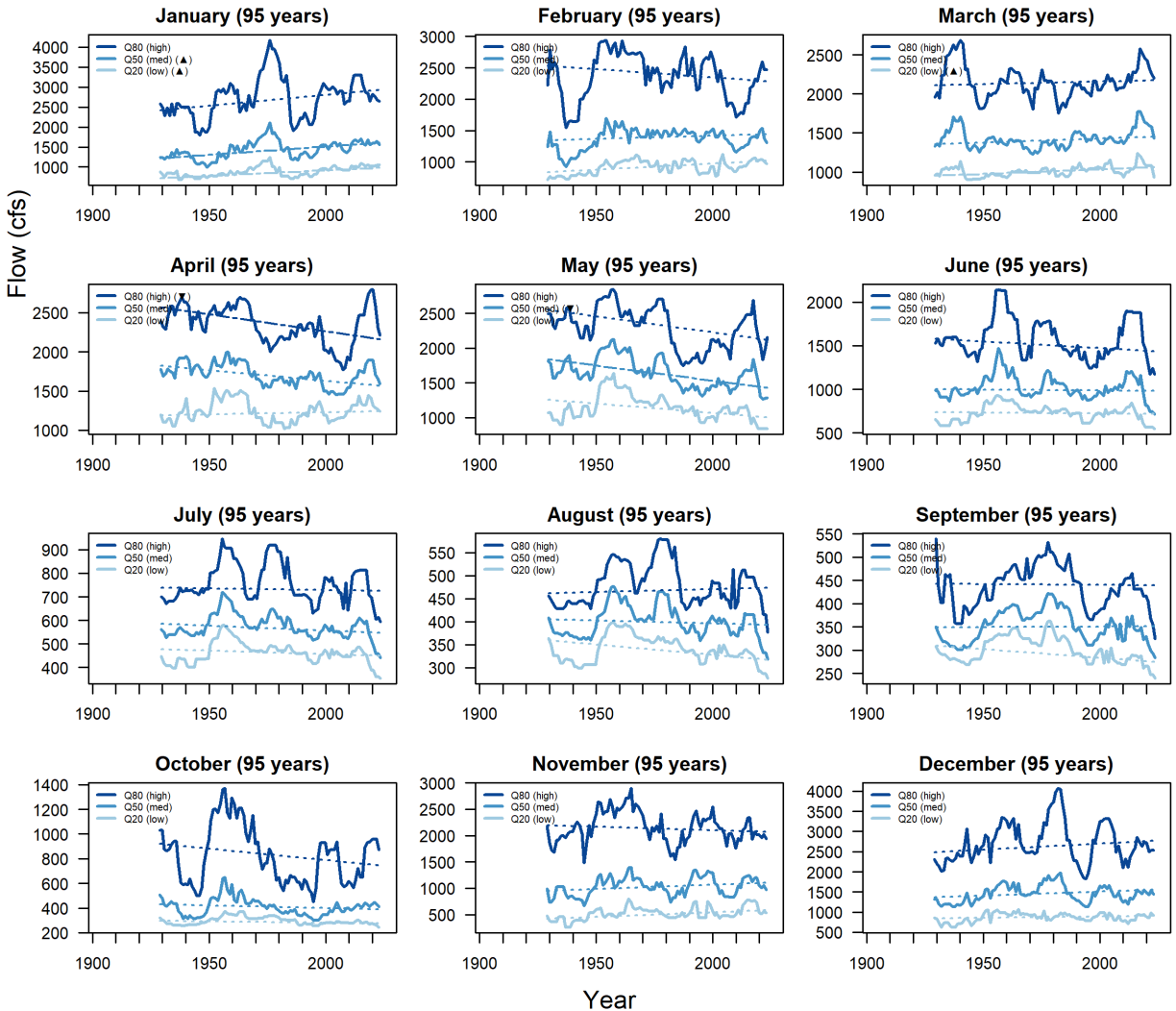
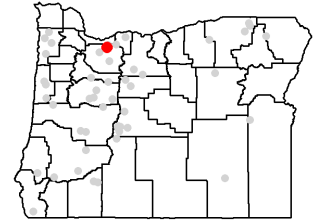


# LT Flow Trends for Station #14137000

## Annual Flow at Station #14137000 (95 years, 1929-2023)

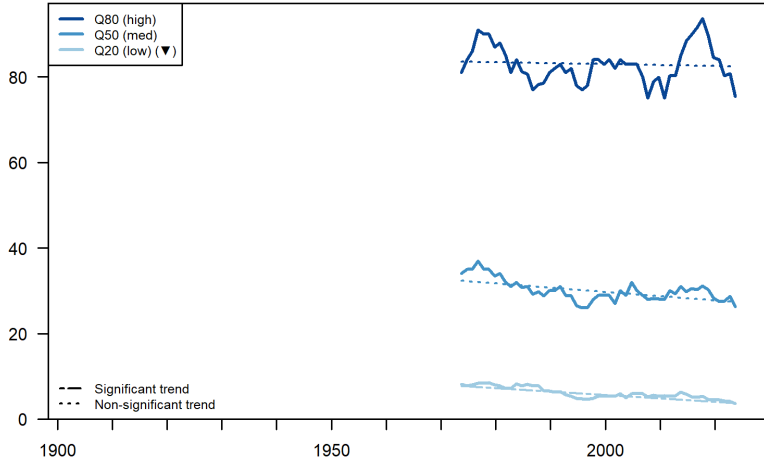


## Station #14137000

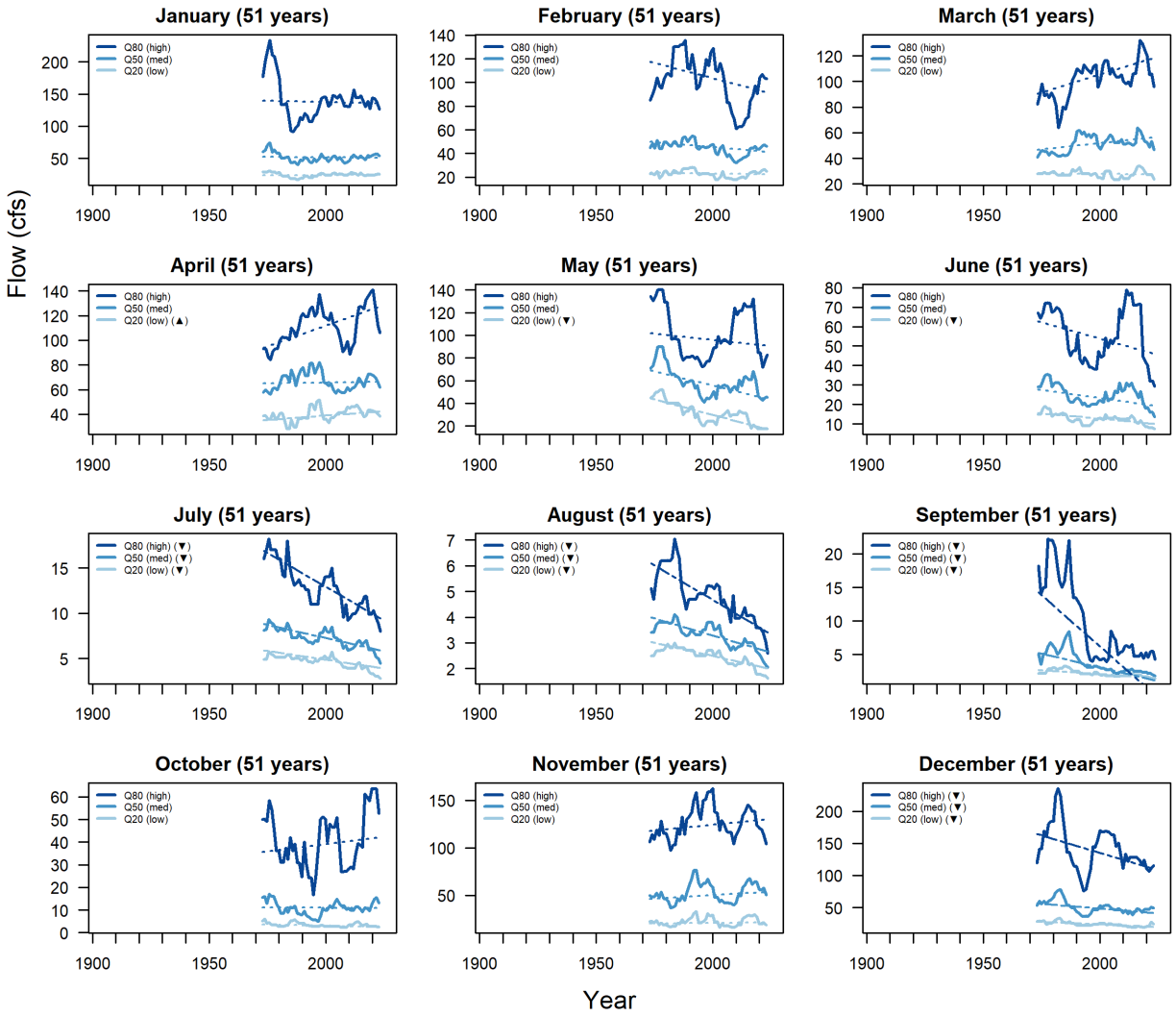
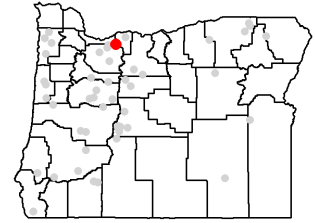


LT Flow Trends for Station #14138800

Annual Flow at Station #14138800 (51 years, 1973-2023)

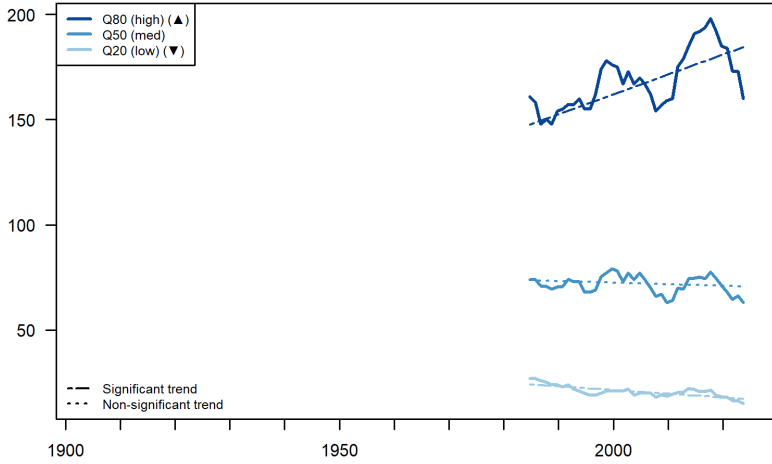


Station #14138800

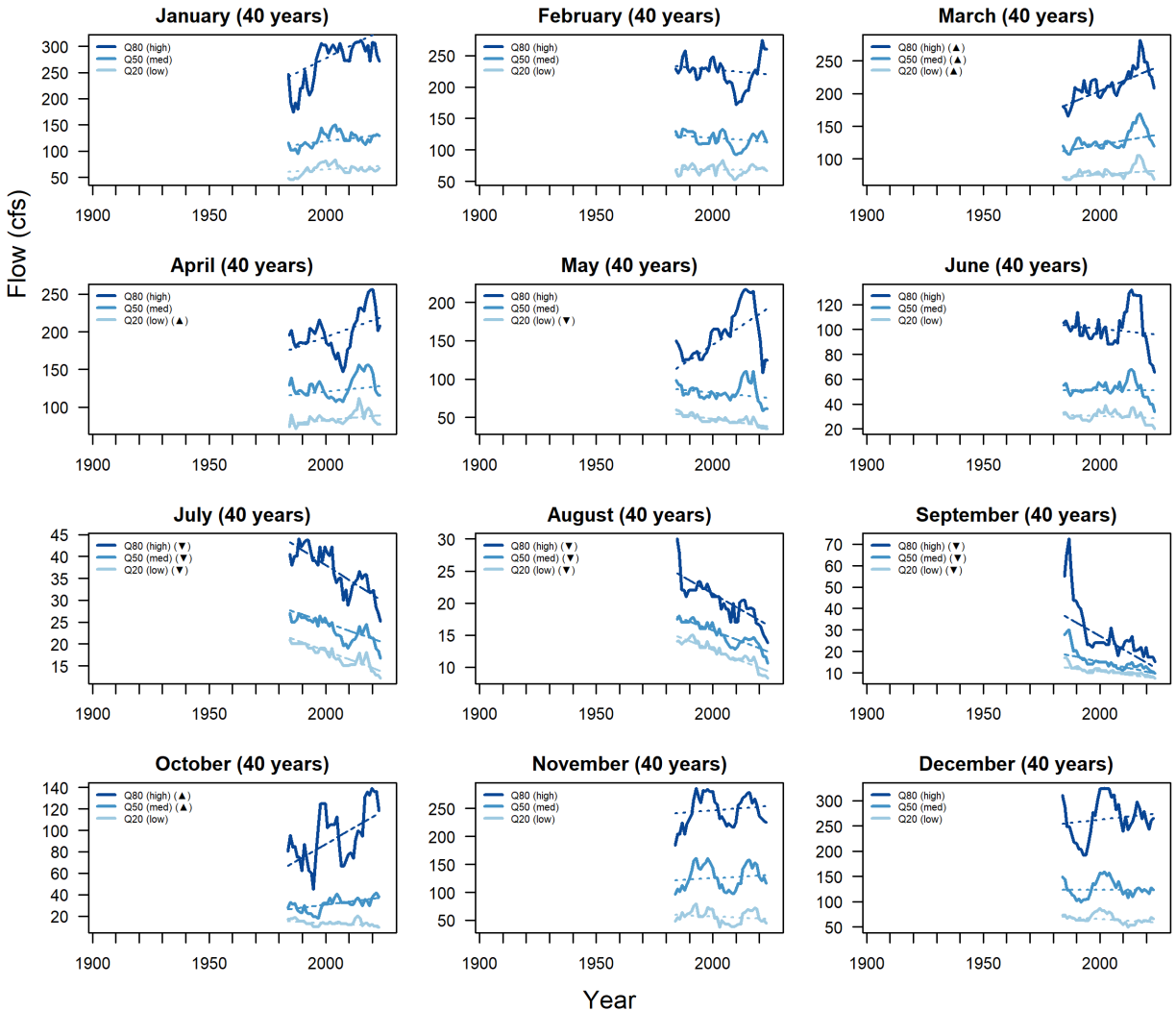
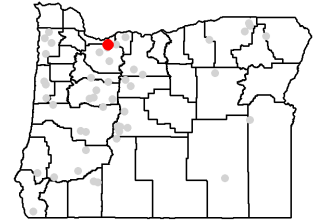


LT Flow Trends for Station #14139800

Annual Flow at Station #14139800 (40 years, 1984-2023)

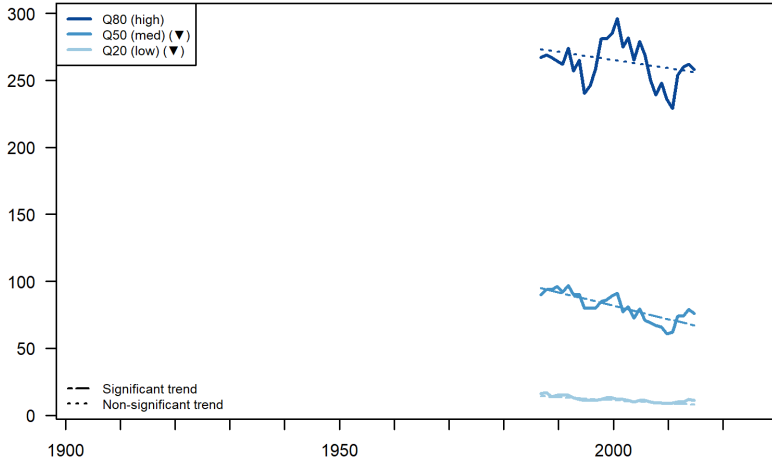


Station #14139800

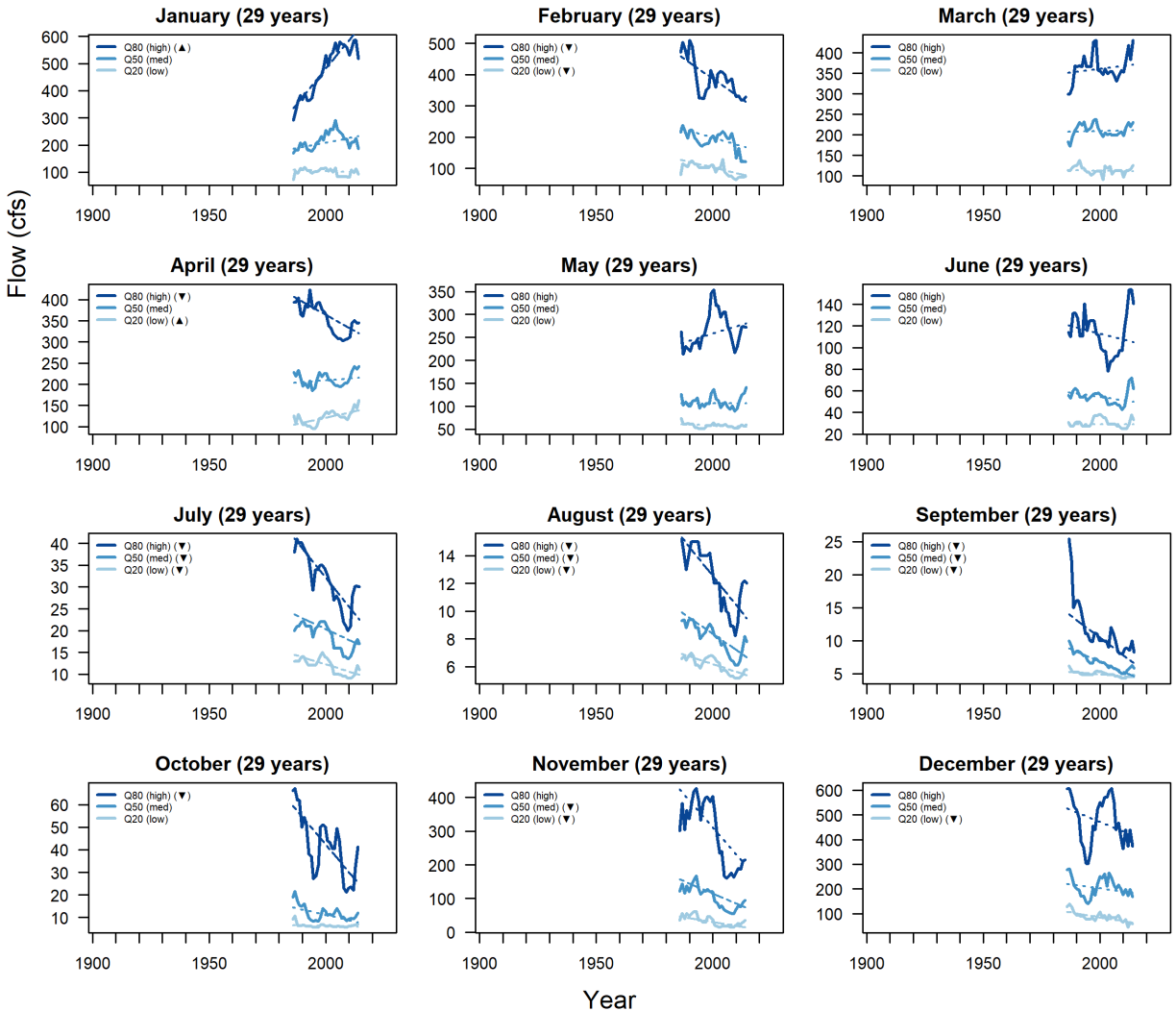
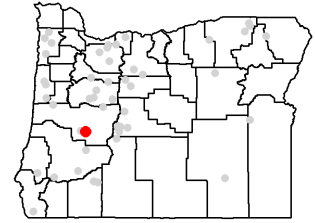


LT Flow Trends for Station #14153800

Annual Flow at Station #14153800 (29 years, 1986-2014)

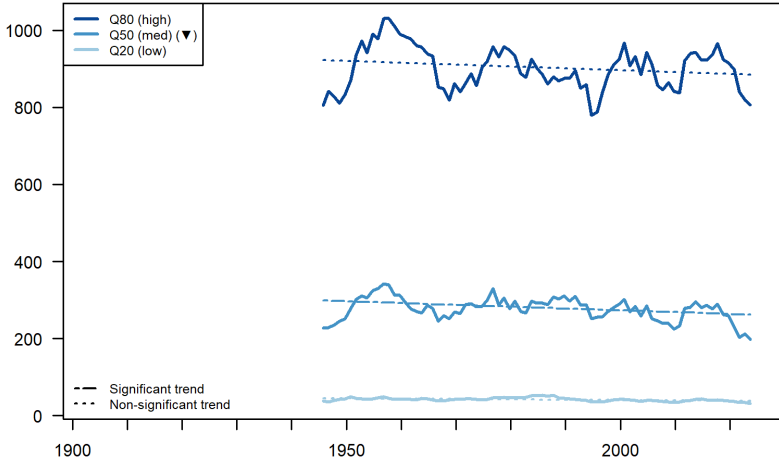


Station #14153800

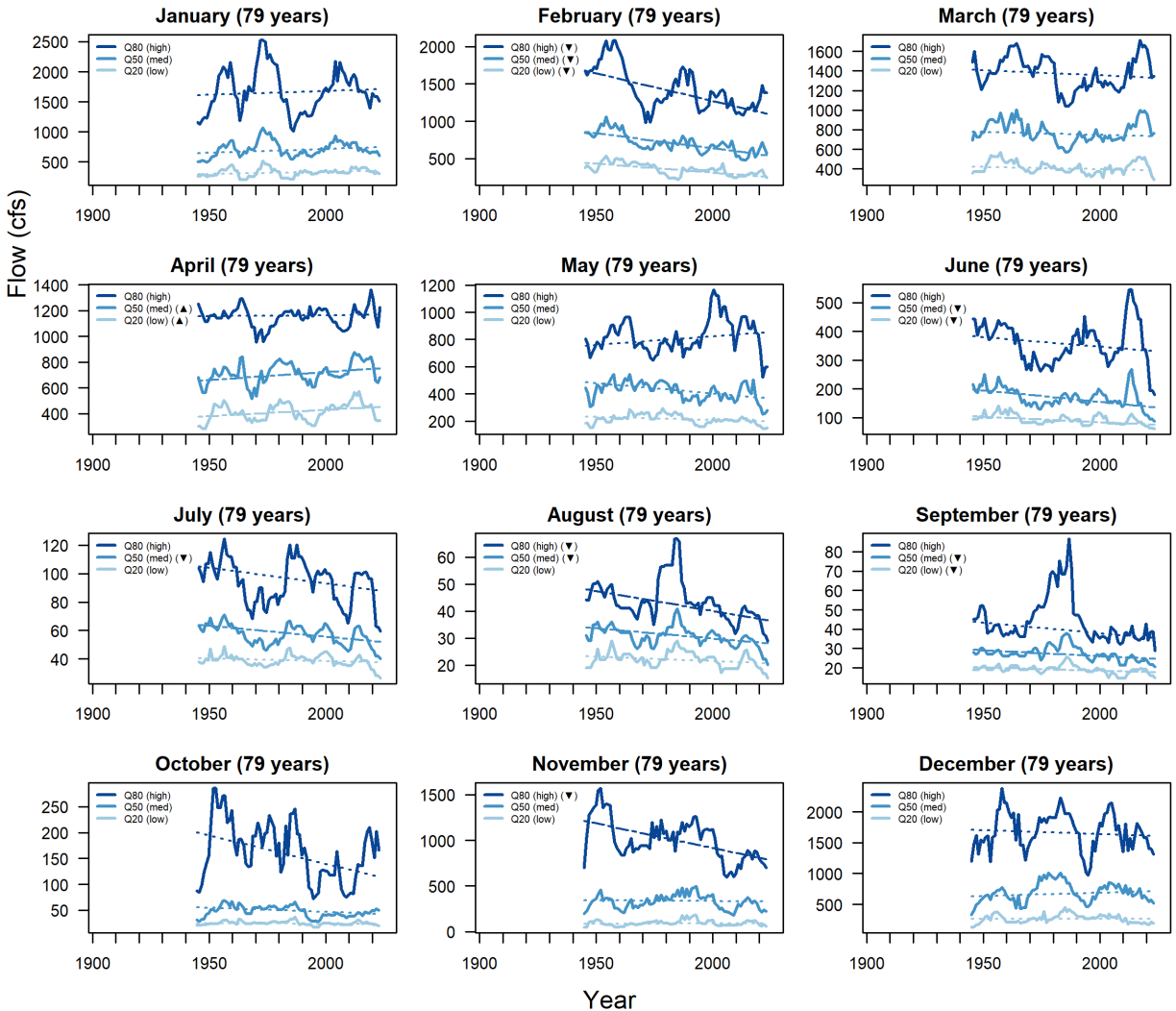
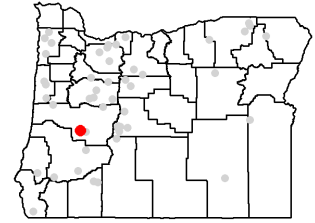


LT Flow Trends for Station #14154500

Annual Flow at Station #14154500 (79 years, 1945-2023)

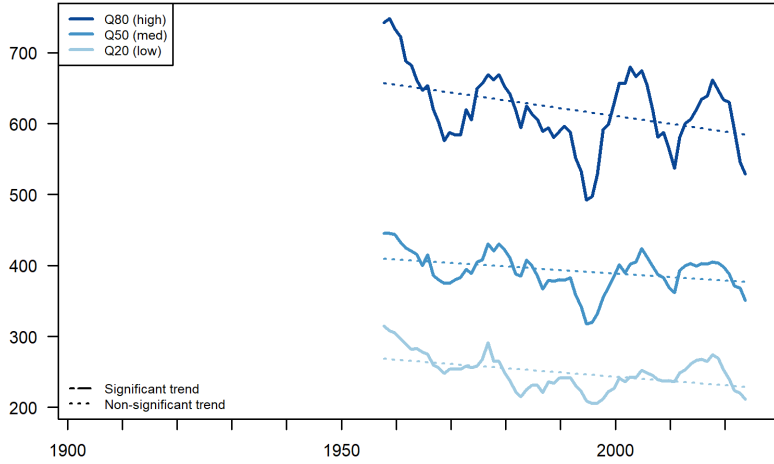


Station #14154500

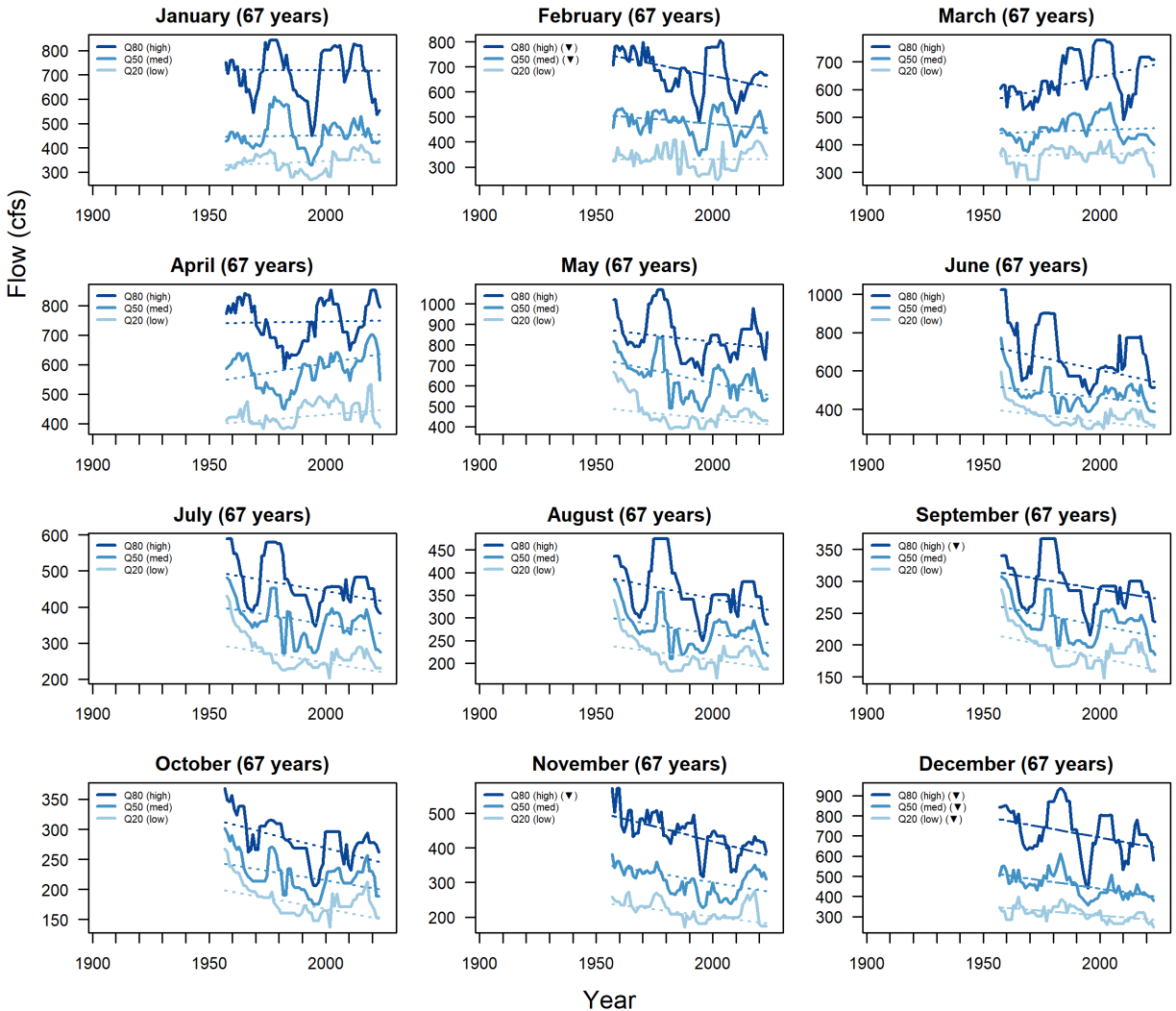
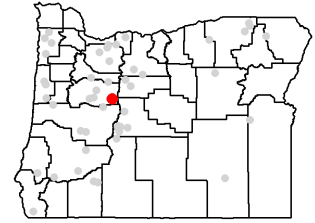


LT Flow Trends for Station #14158500

Annual Flow at Station #14158500 (67 years, 1957-2023)

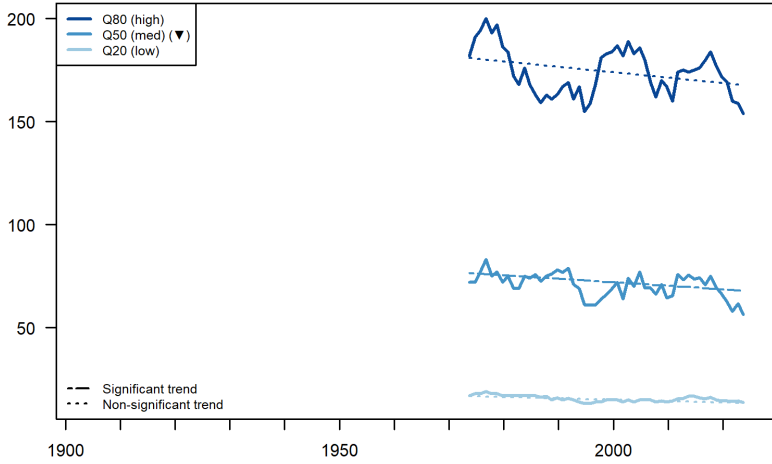


Station #14158500

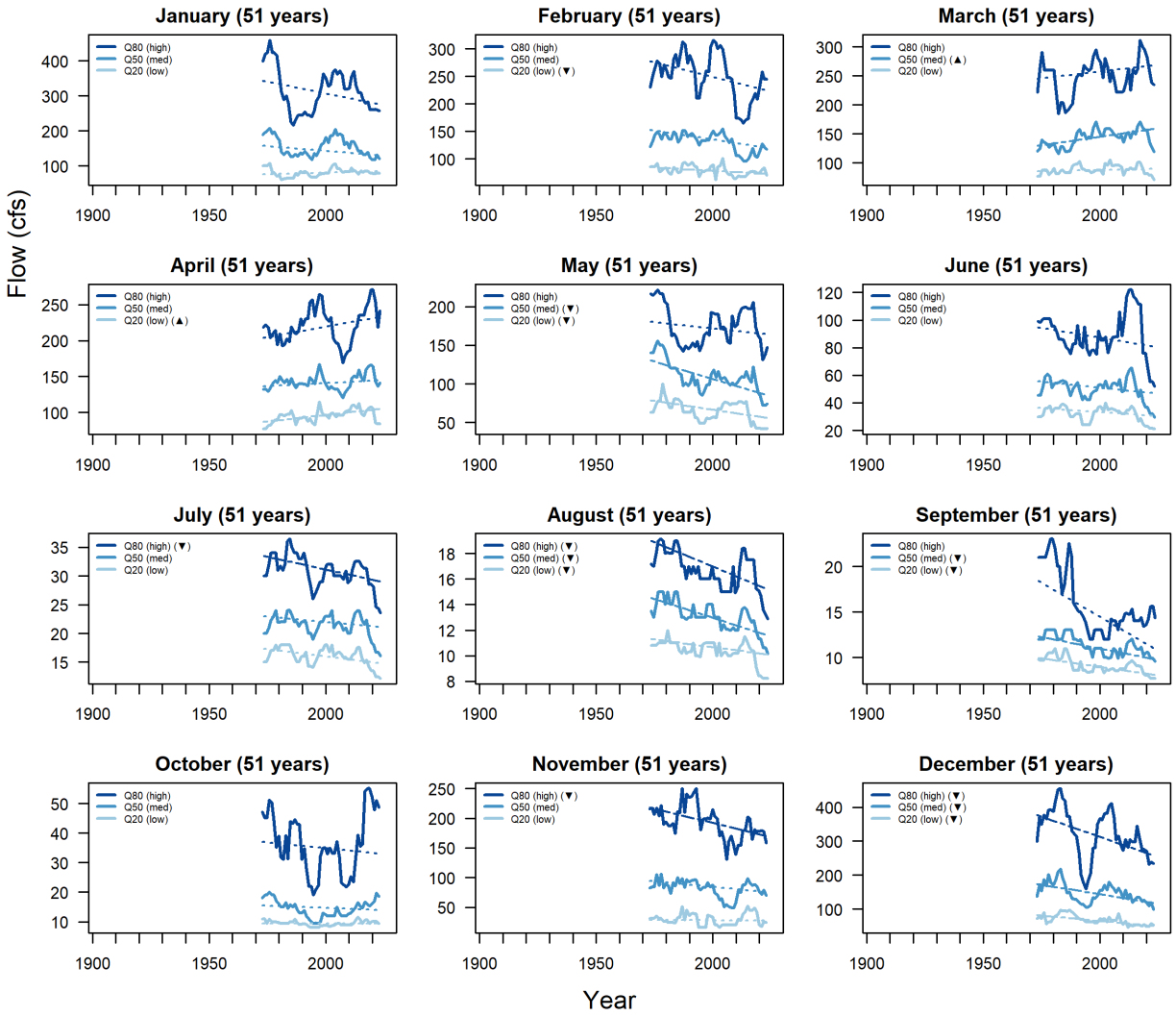
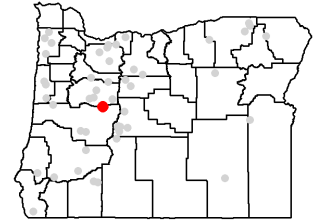


LT Flow Trends for Station #14161500

Annual Flow at Station #14161500 (51 years, 1973-2023)

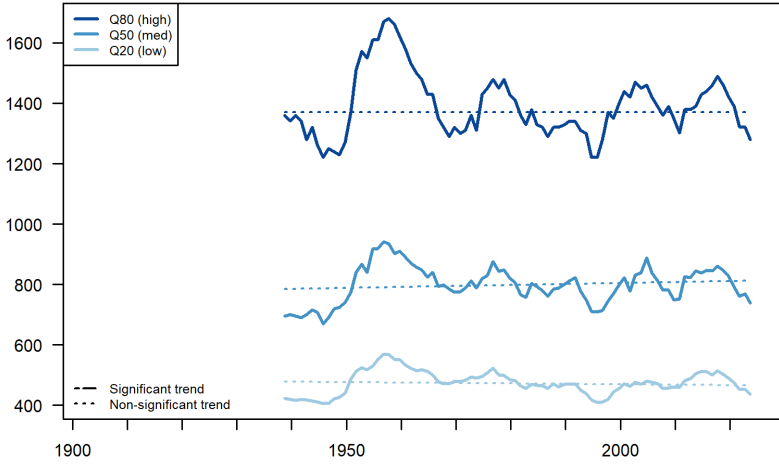


Station #14161500

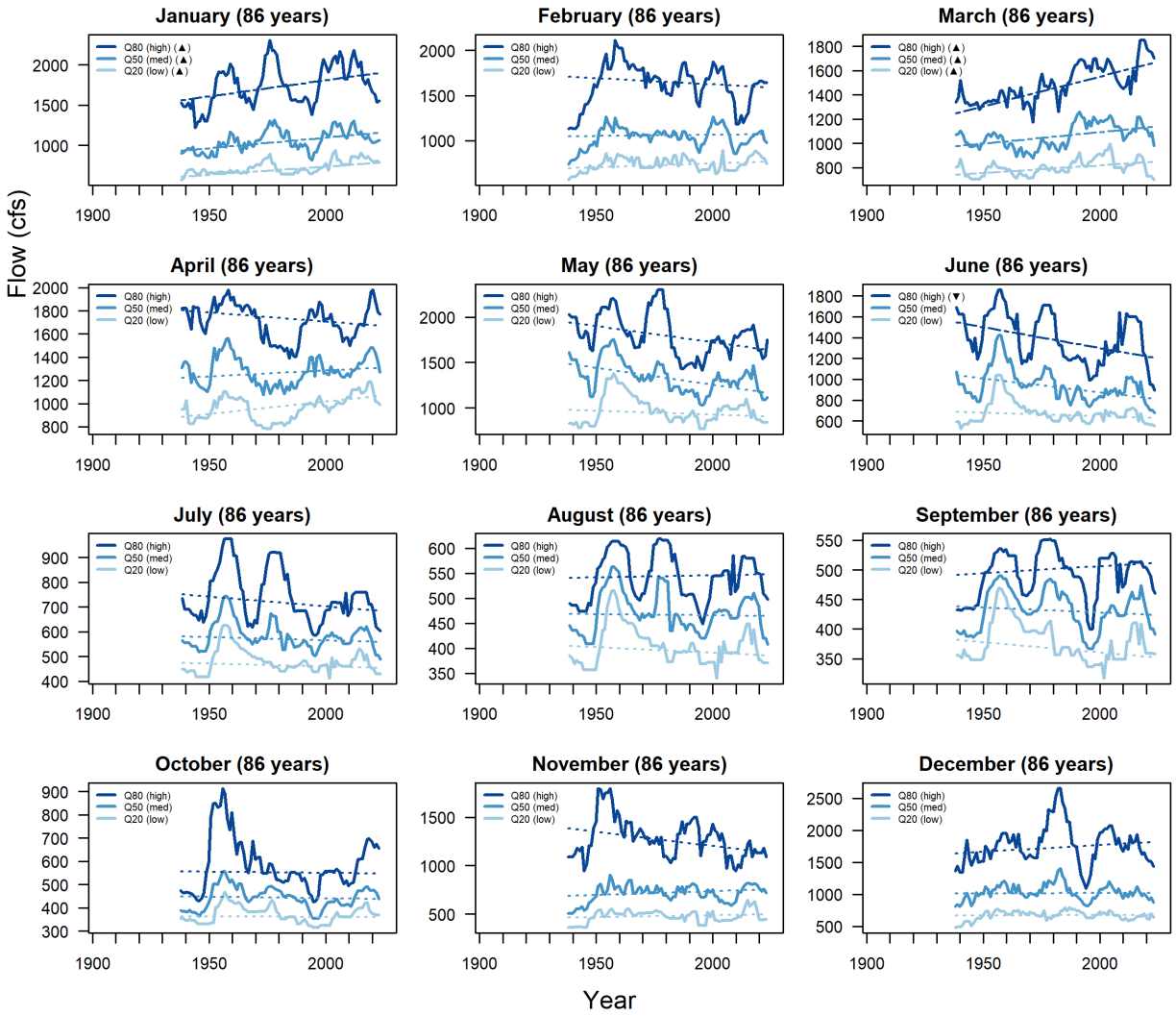
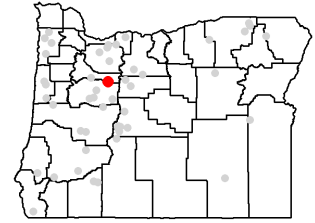


LT Flow Trends for Station #14178000

Annual Flow at Station #14178000 (86 years, 1938-2023)

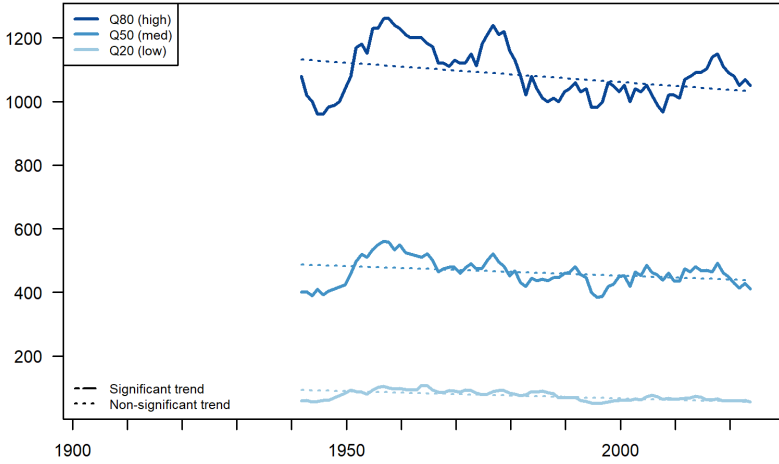


Station #14178000

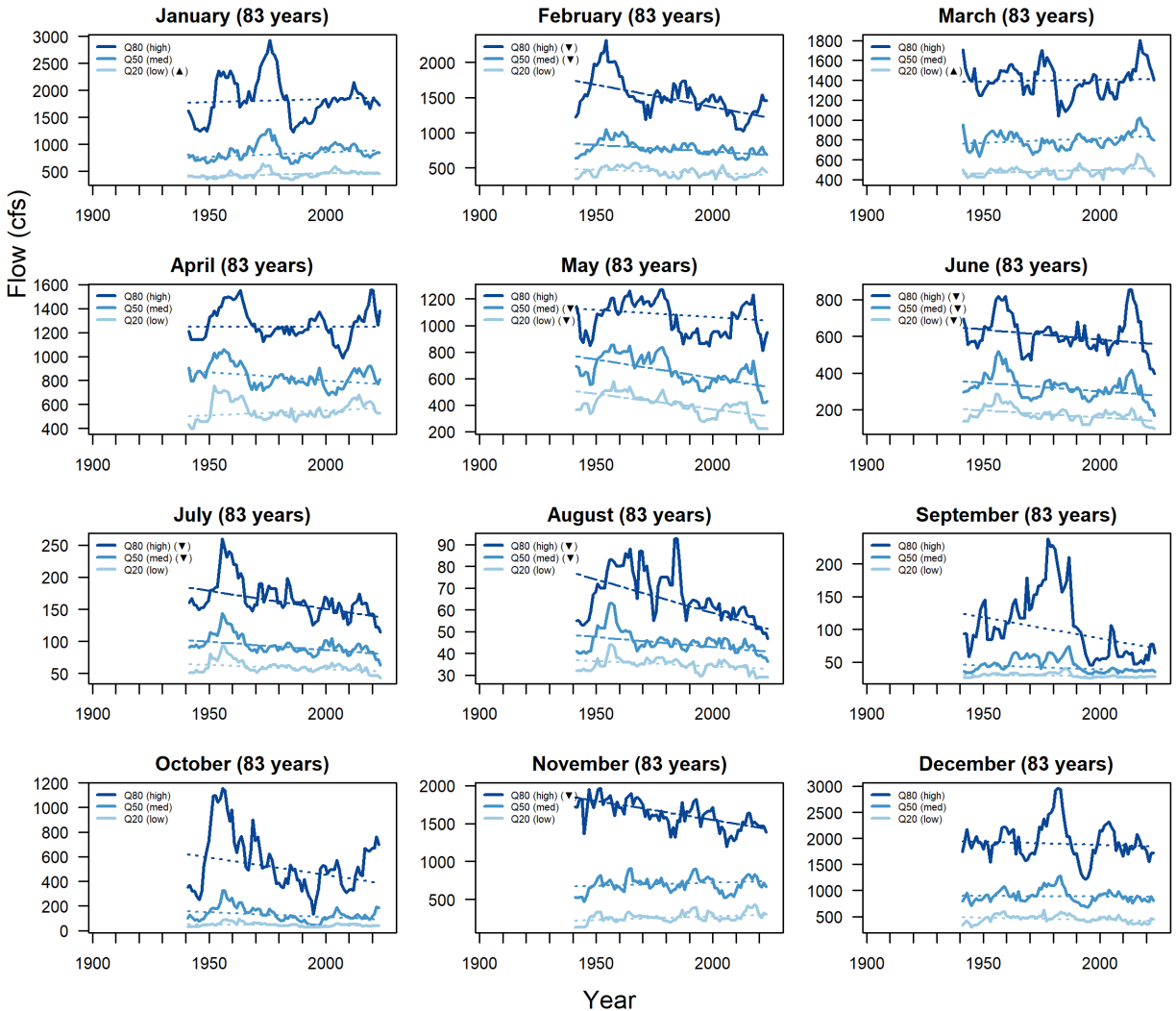
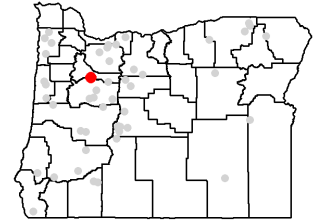


LT Flow Trends for Station #14182500

Annual Flow at Station #14182500 (83 years, 1941-2023)

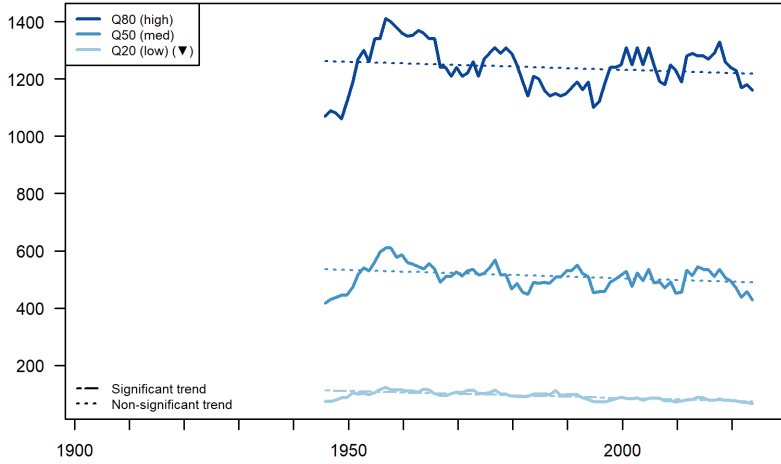


Station #14182500

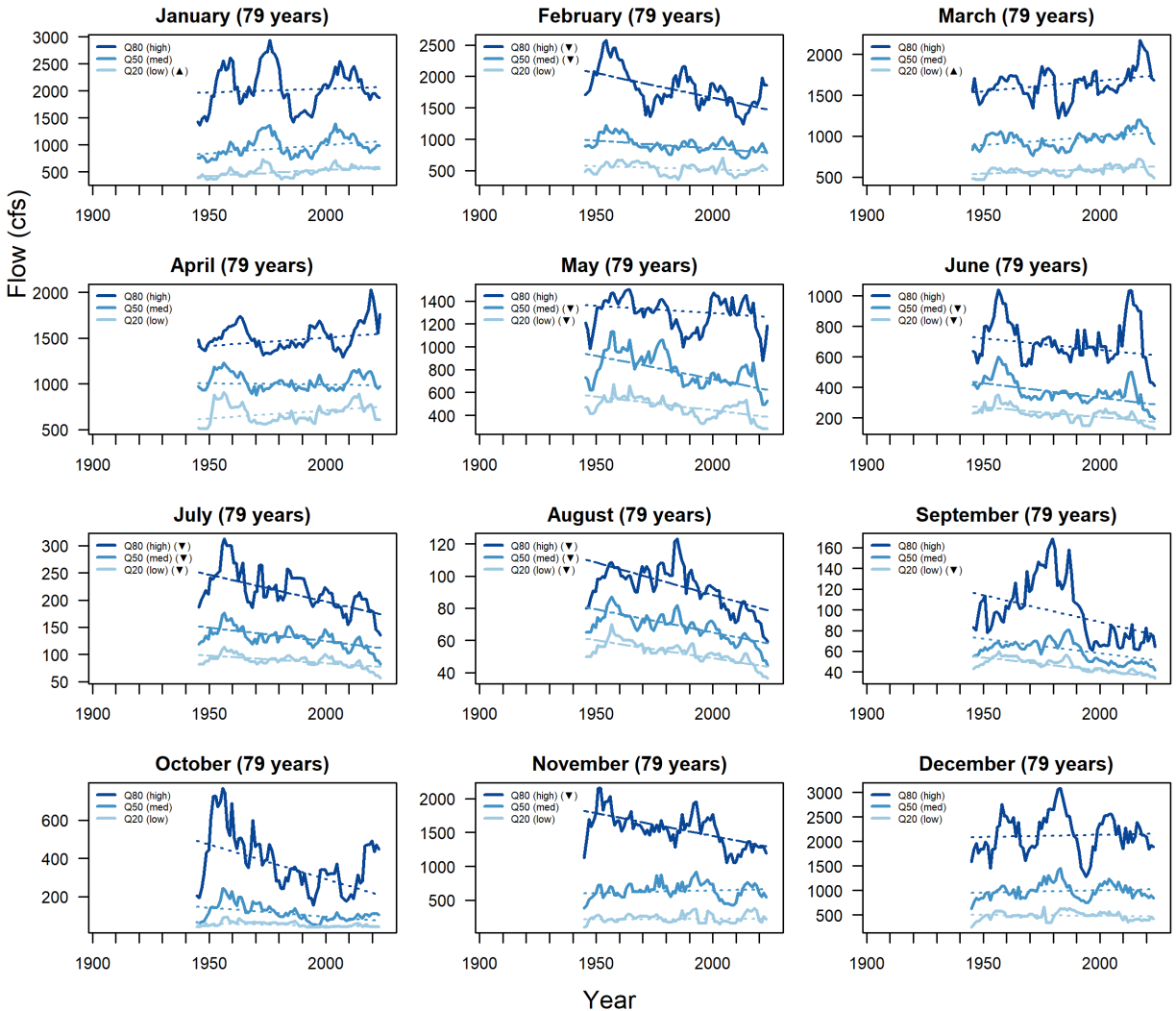
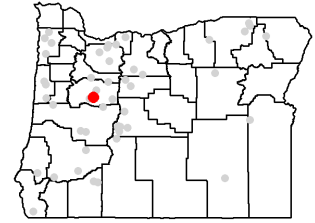


LT Flow Trends for Station #14185000

Annual Flow at Station #14185000 (79 years, 1945-2023)

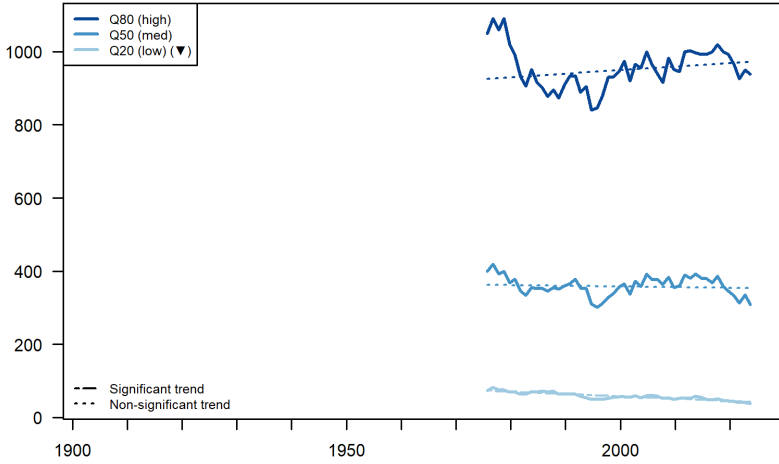


Station #14185000

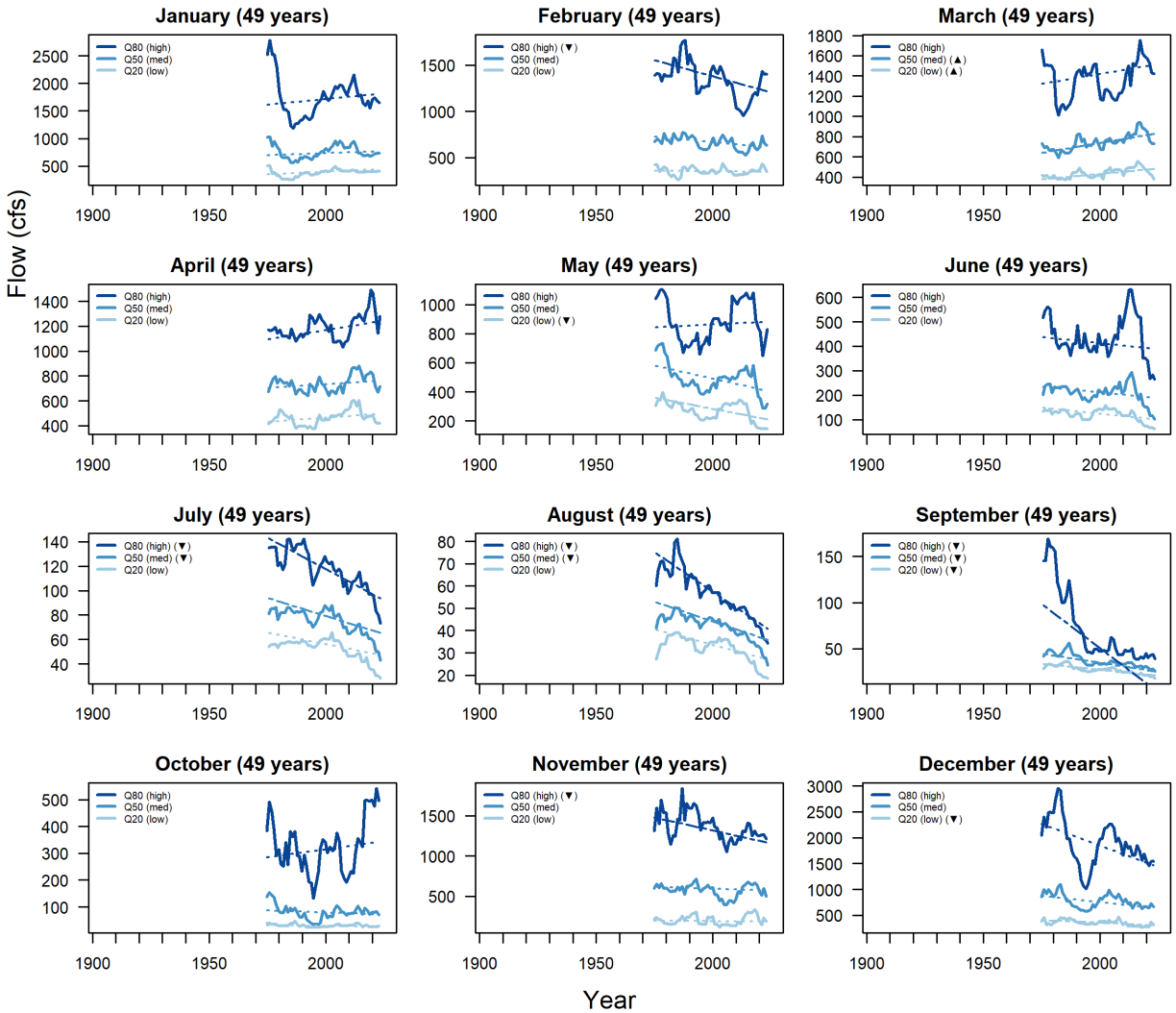
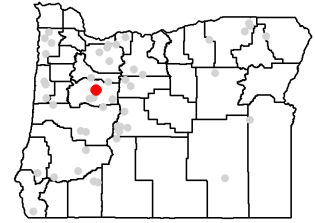


LT Flow Trends for Station #14185900

Annual Flow at Station #14185900 (49 years, 1975-2023)

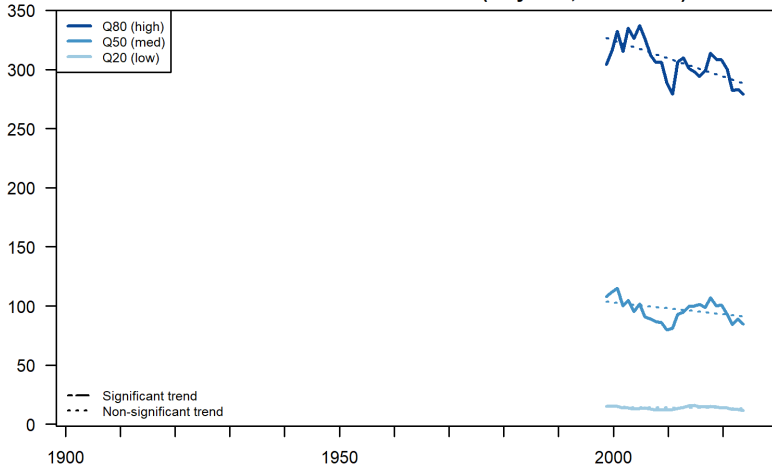


Station #14185900

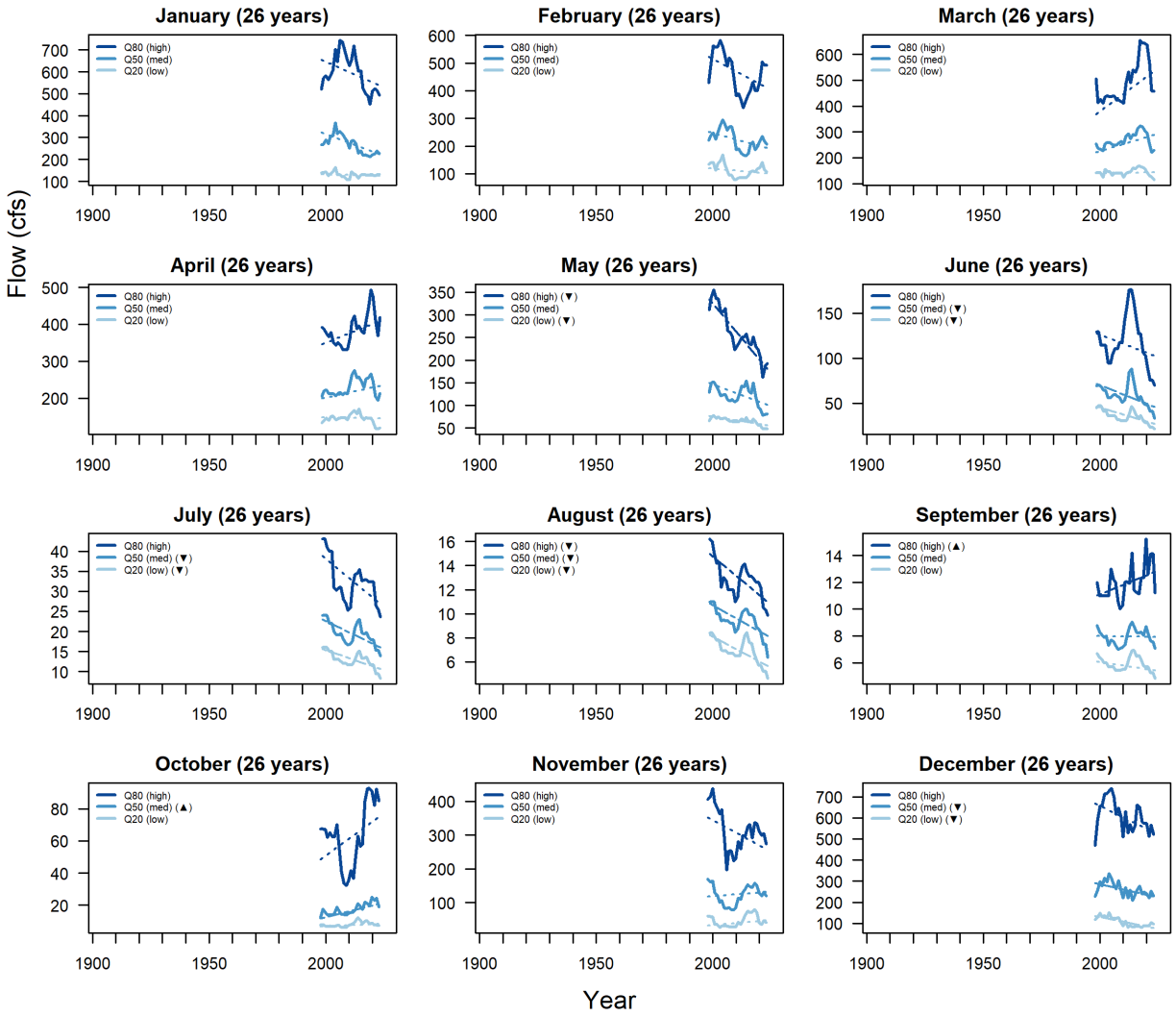
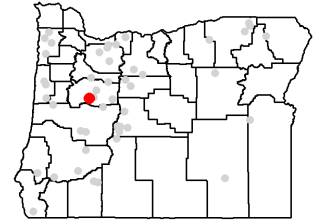


LT Flow Trends for Station #14187000

Annual Flow at Station #14187000 (26 years, 1998-2023)

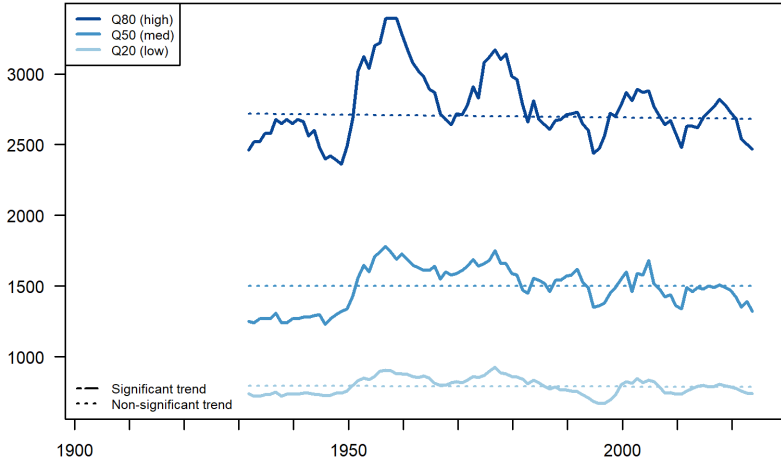


Station #14187000

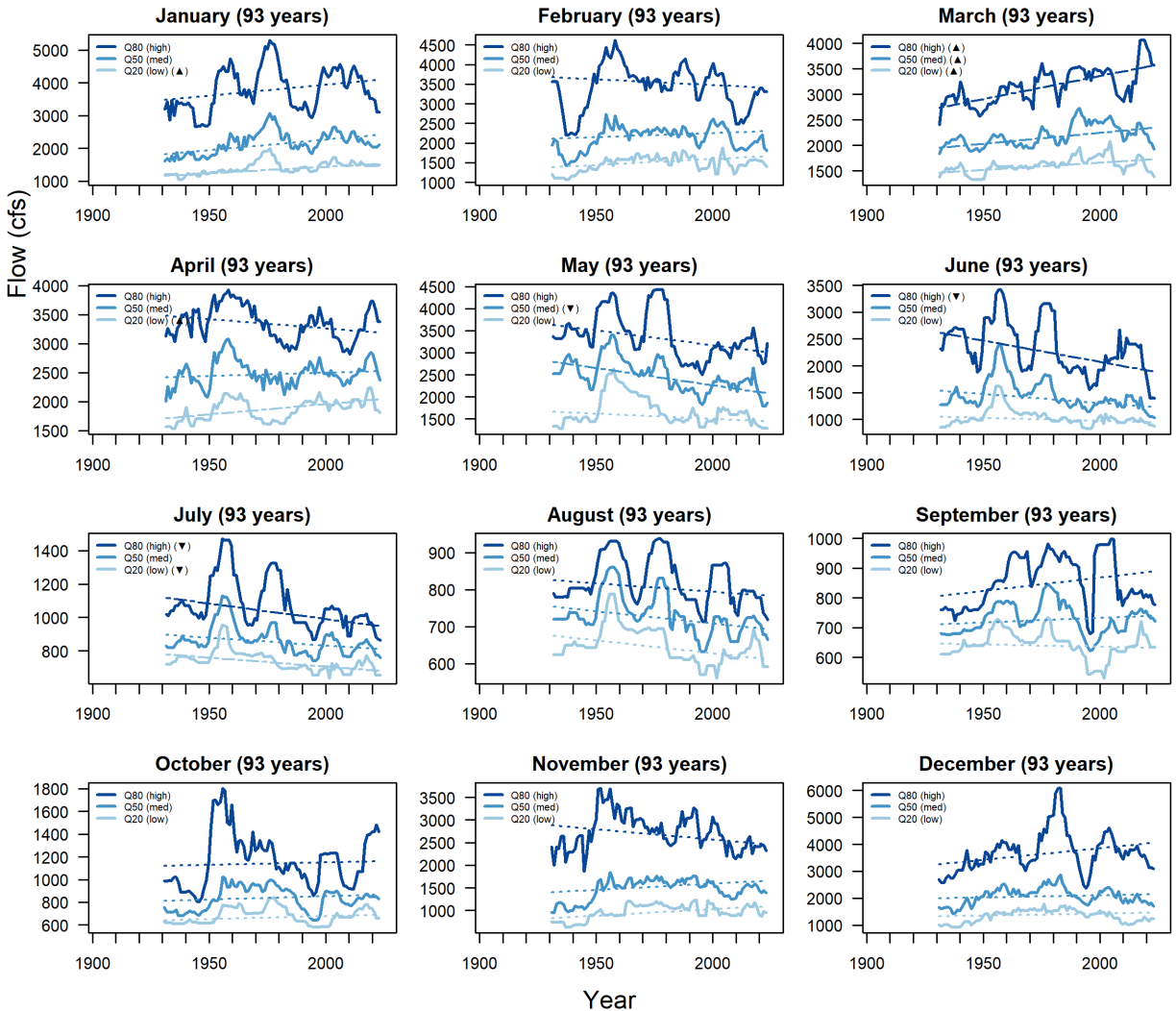
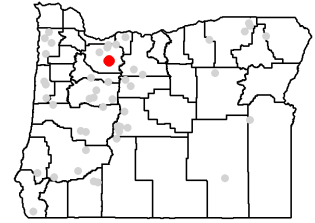


LT Flow Trends for Station #14209500

Annual Flow at Station #14209500 (93 years, 1931-2023)

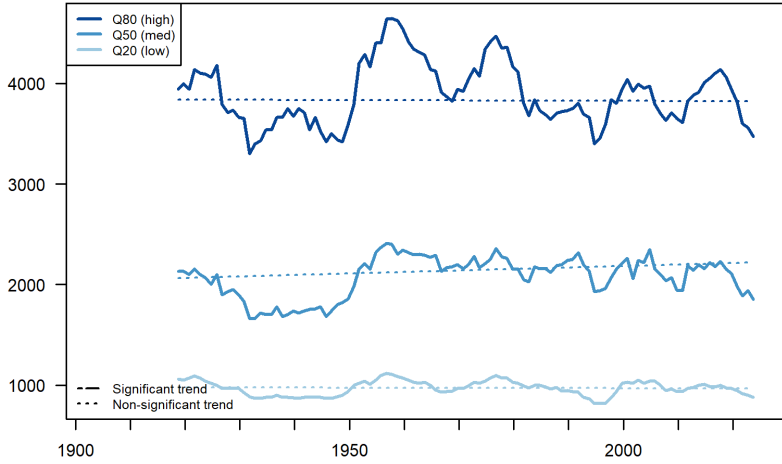


Station #14209500

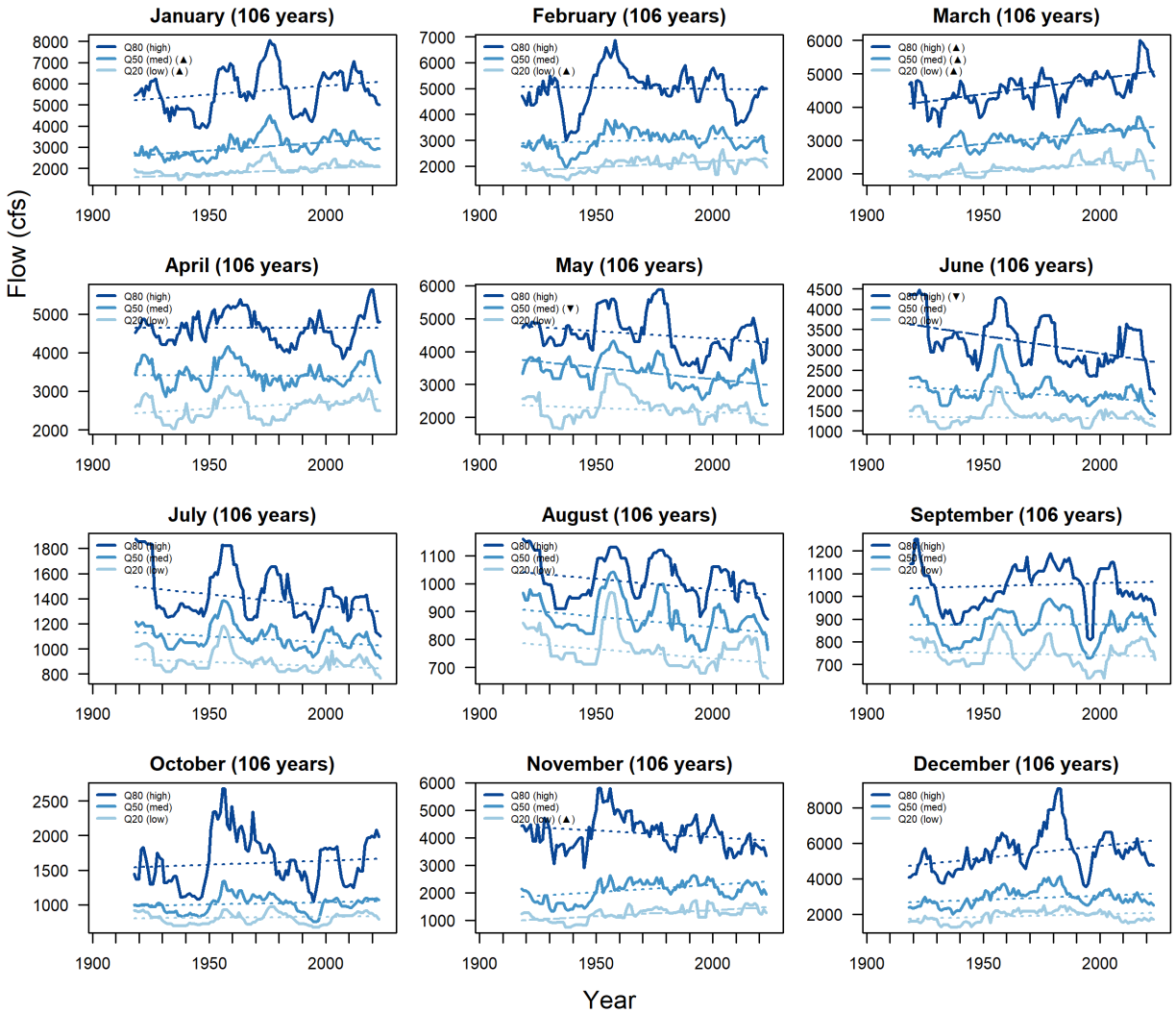
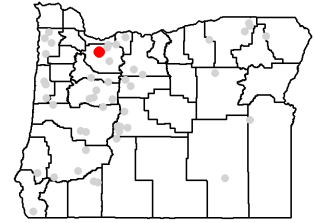


LT Flow Trends for Station #14210000

Annual Flow at Station #14210000 (106 years, 1918-2023)

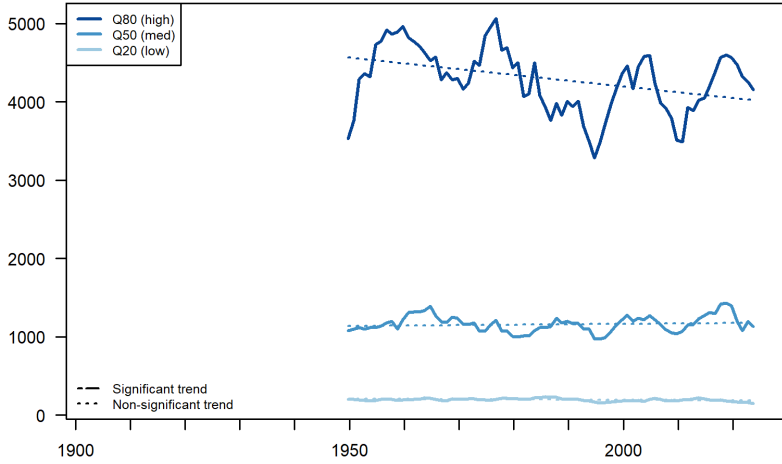


Station #14210000

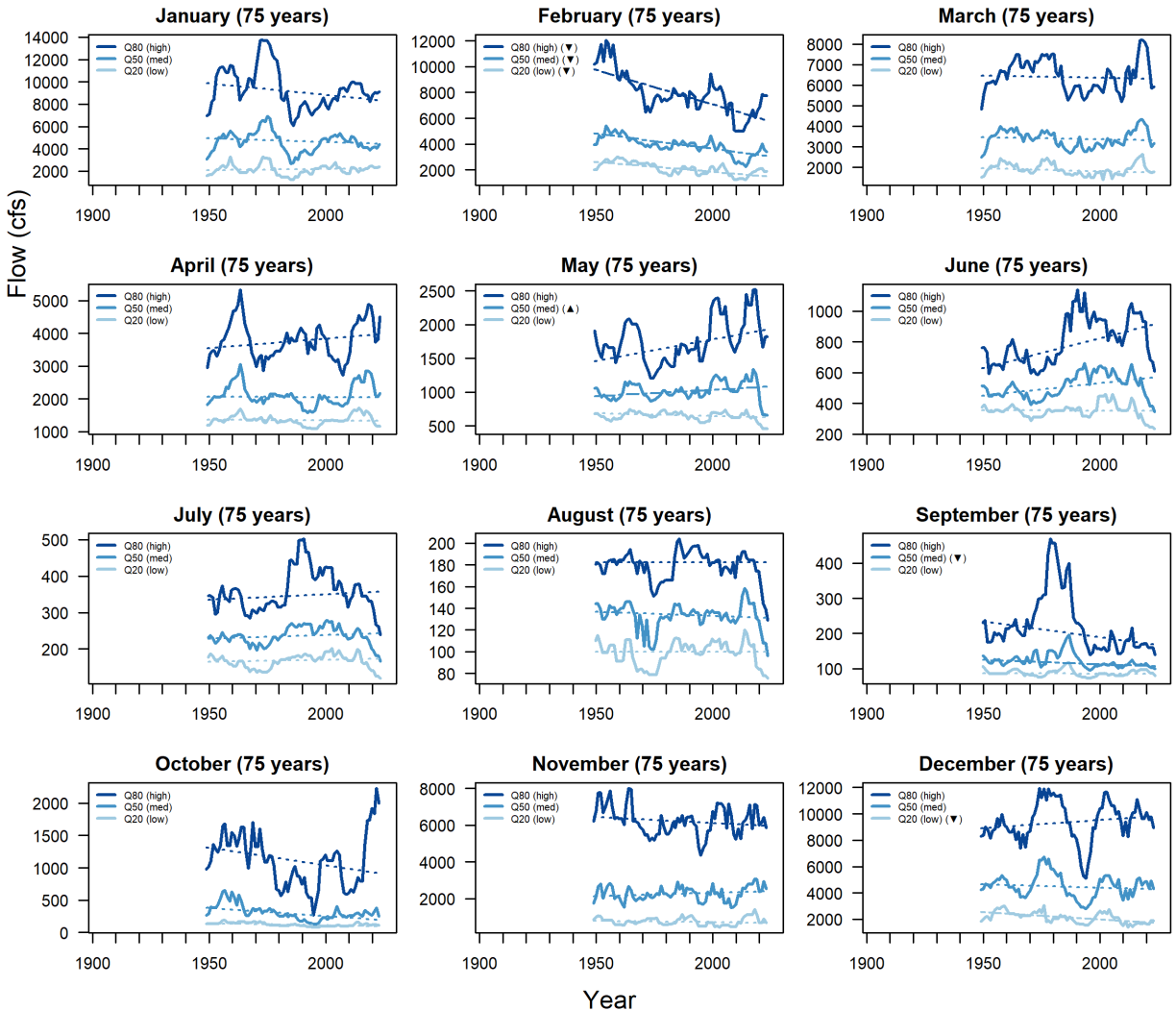
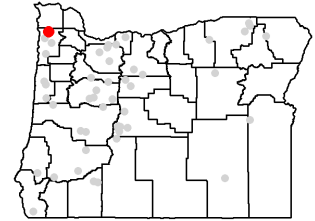


# LT Flow Trends for Station #14301000

## Annual Flow at Station #14301000 (75 years, 1949-2023)

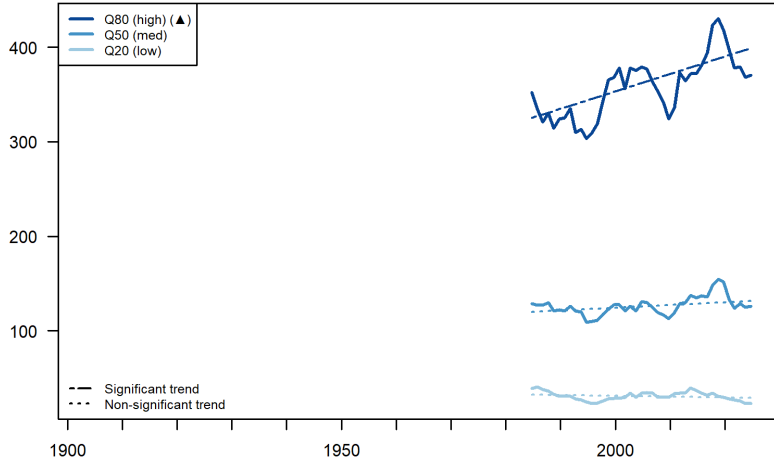


## Station #14301000

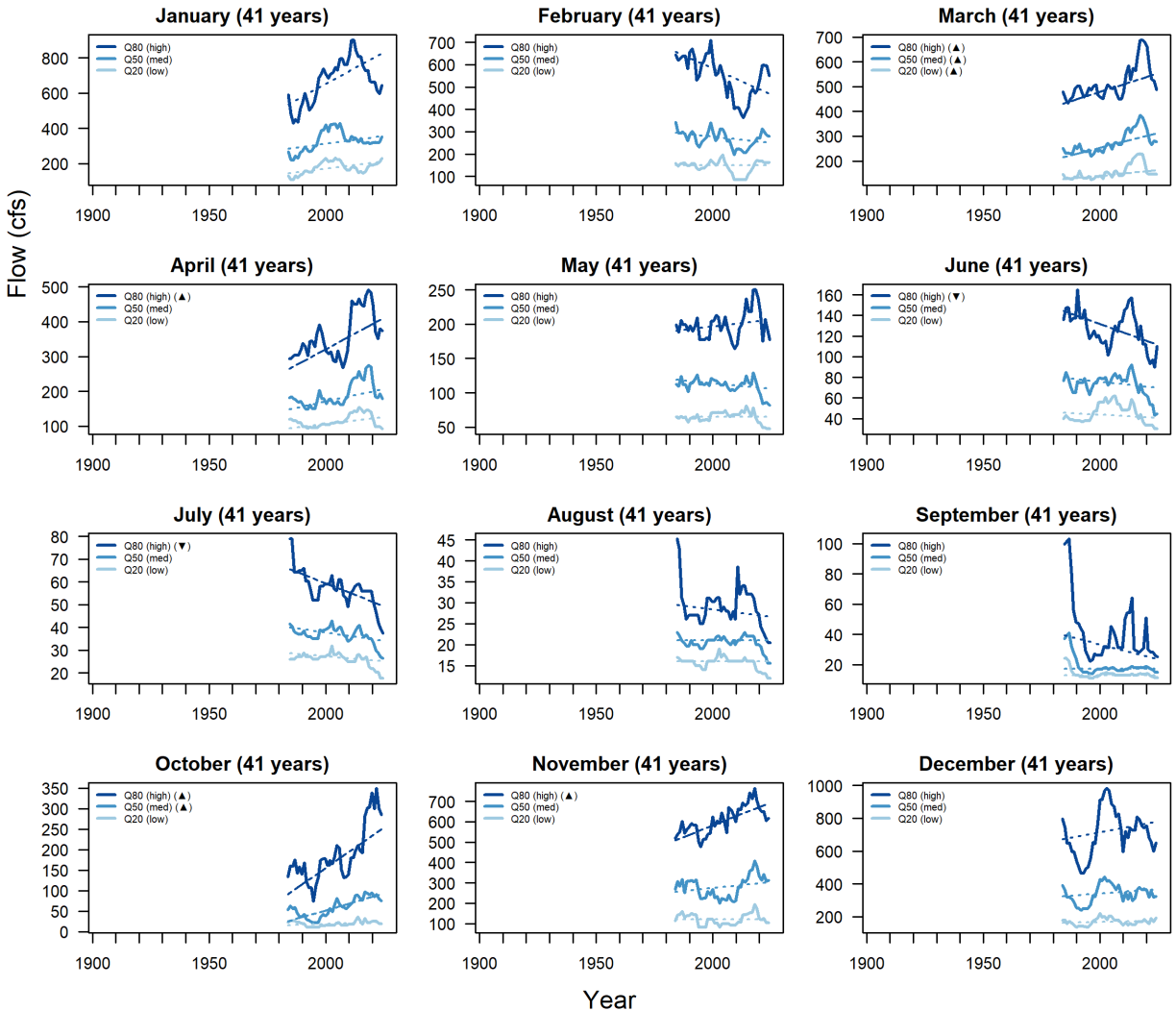
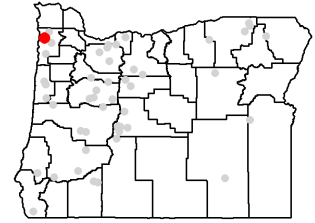


LT Flow Trends for Station #14301300

Annual Flow at Station #14301300 (41 years, 1984-2024)

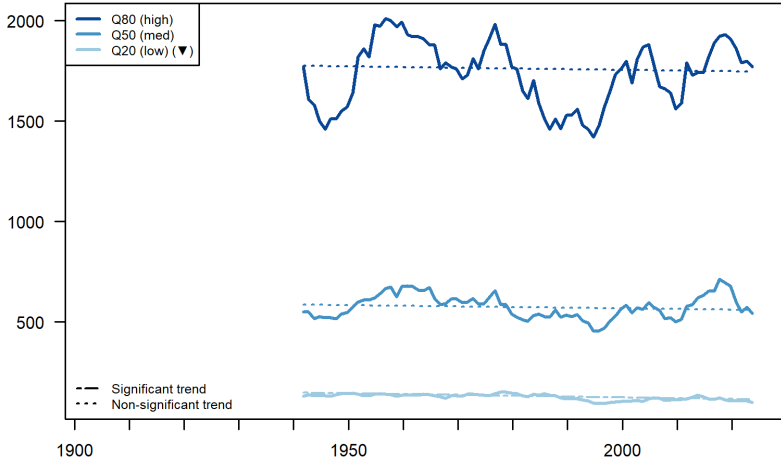


Station #14301300

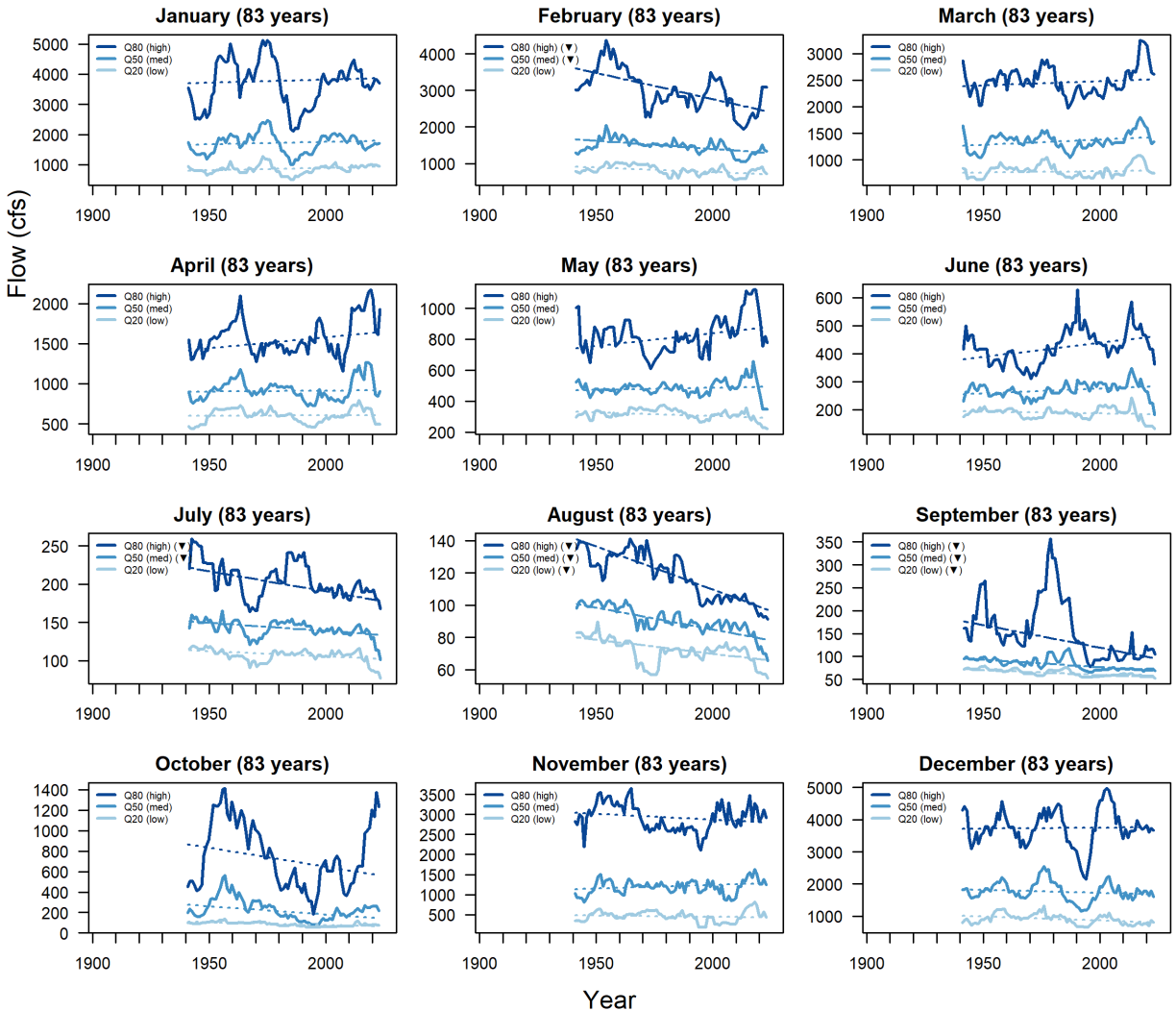
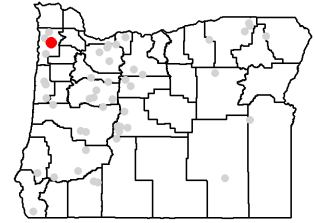


LT Flow Trends for Station #14301500

Annual Flow at Station #14301500 (83 years, 1941-2023)

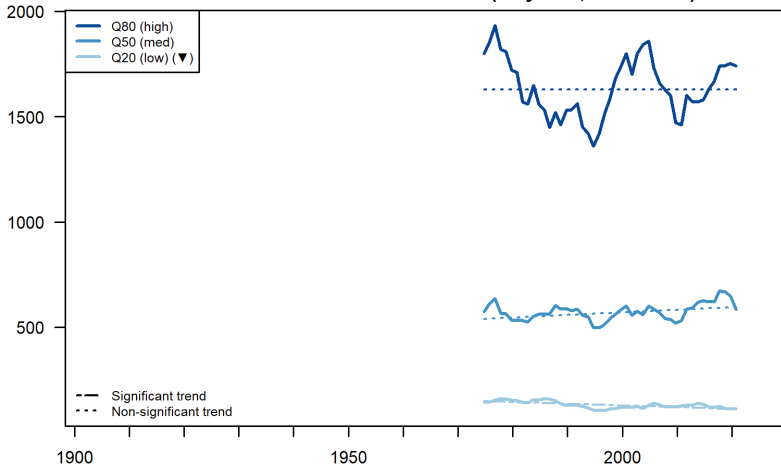


Station #14301500

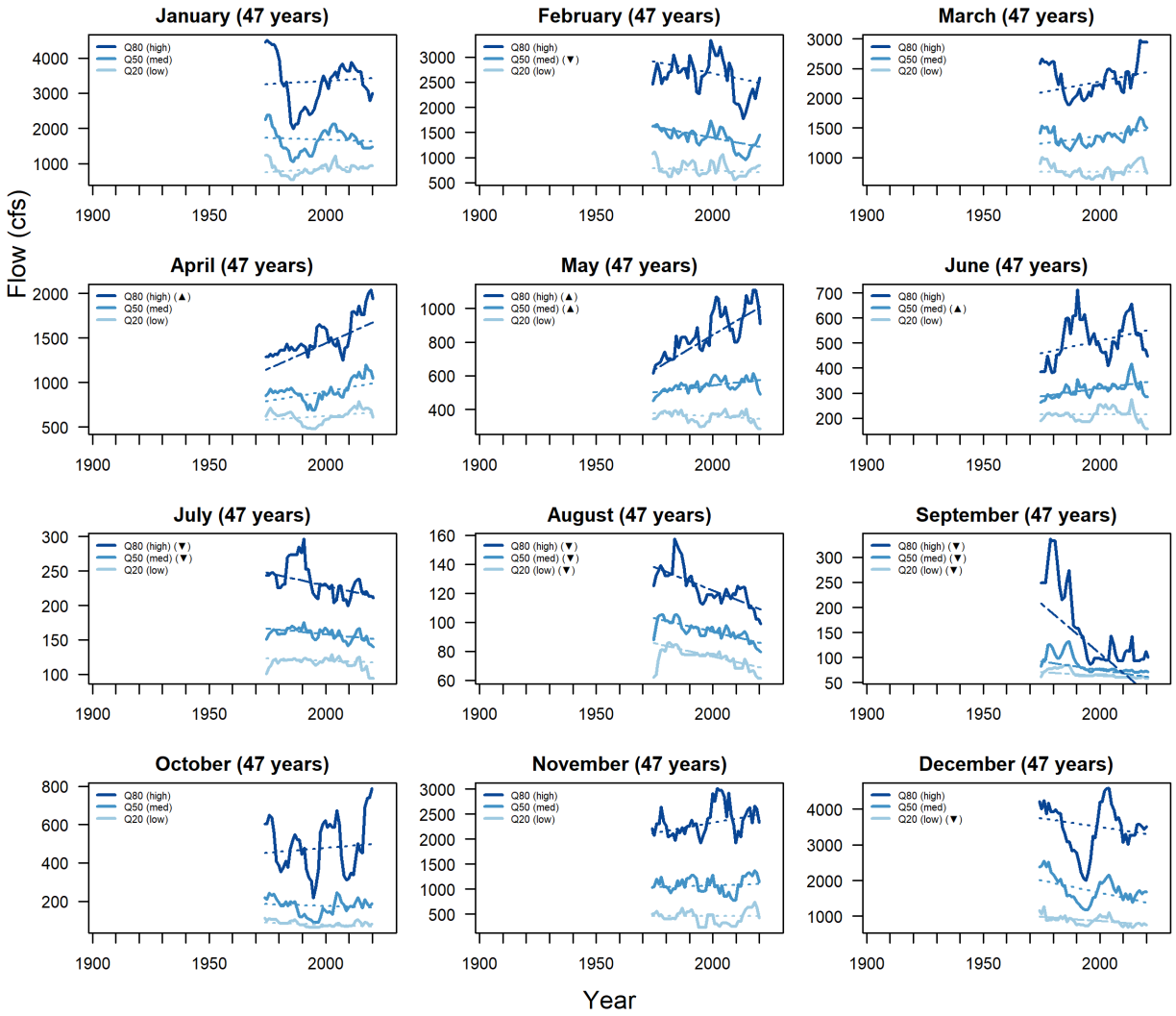
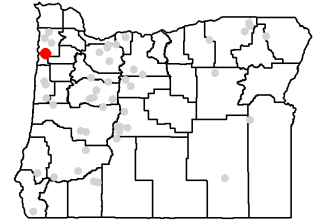


LT Flow Trends for Station #14303600

Annual Flow at Station #14303600 (47 years, 1974-2020)

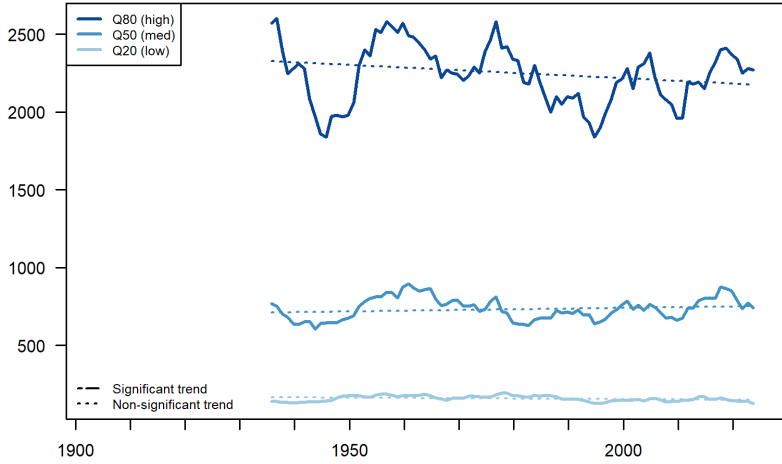


Station #14303600

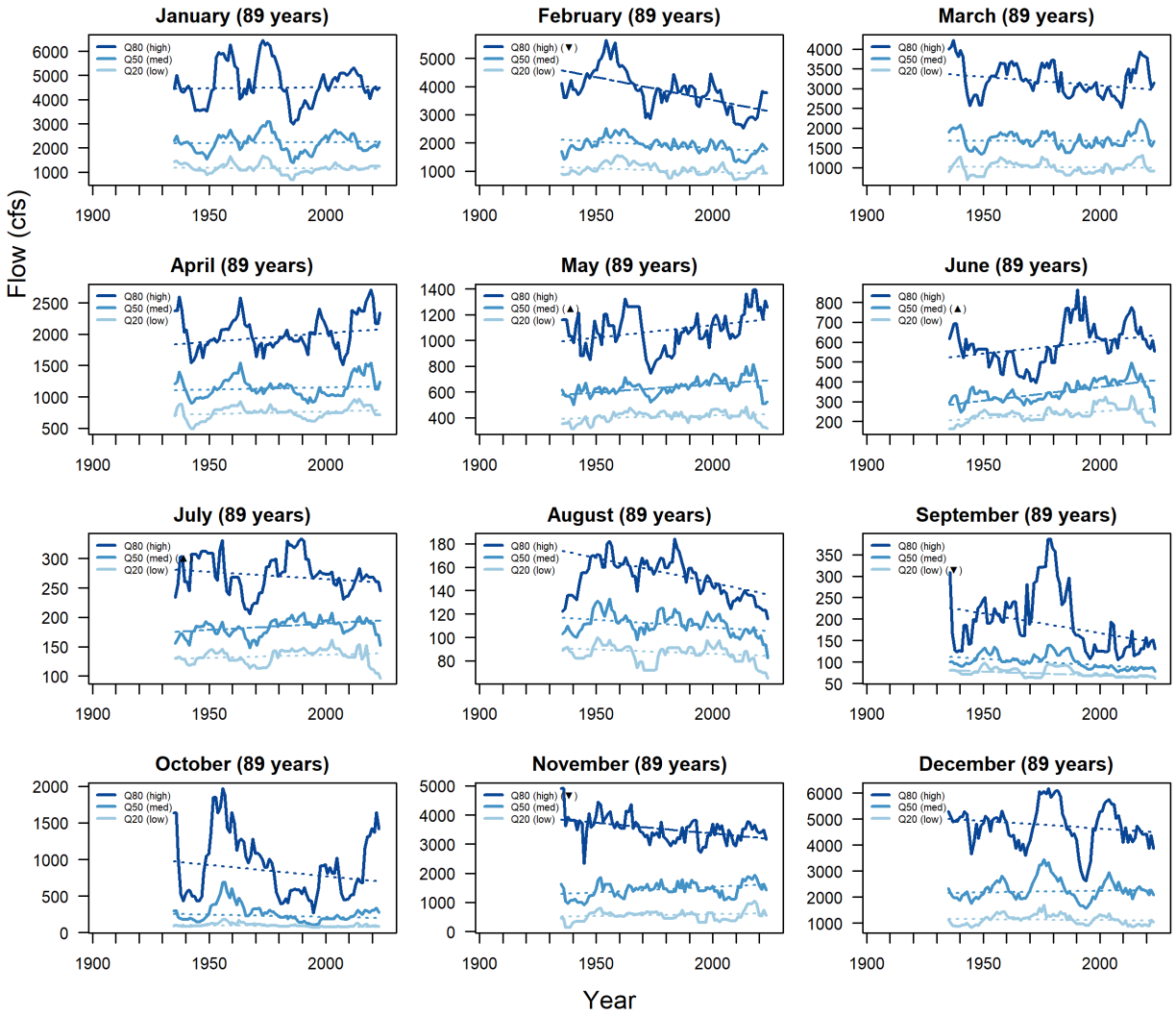
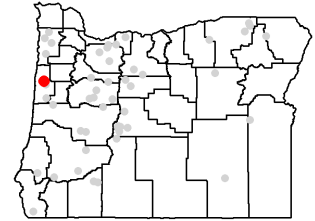


LT Flow Trends for Station #14305500

Annual Flow at Station #14305500 (89 years, 1935-2023)

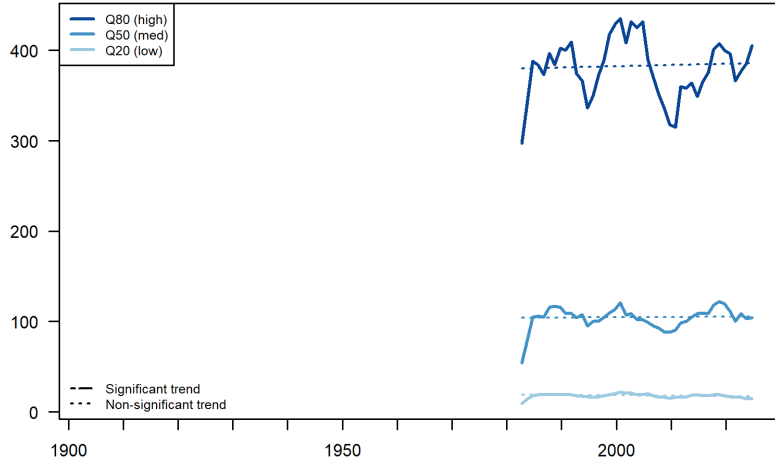


Station #14305500

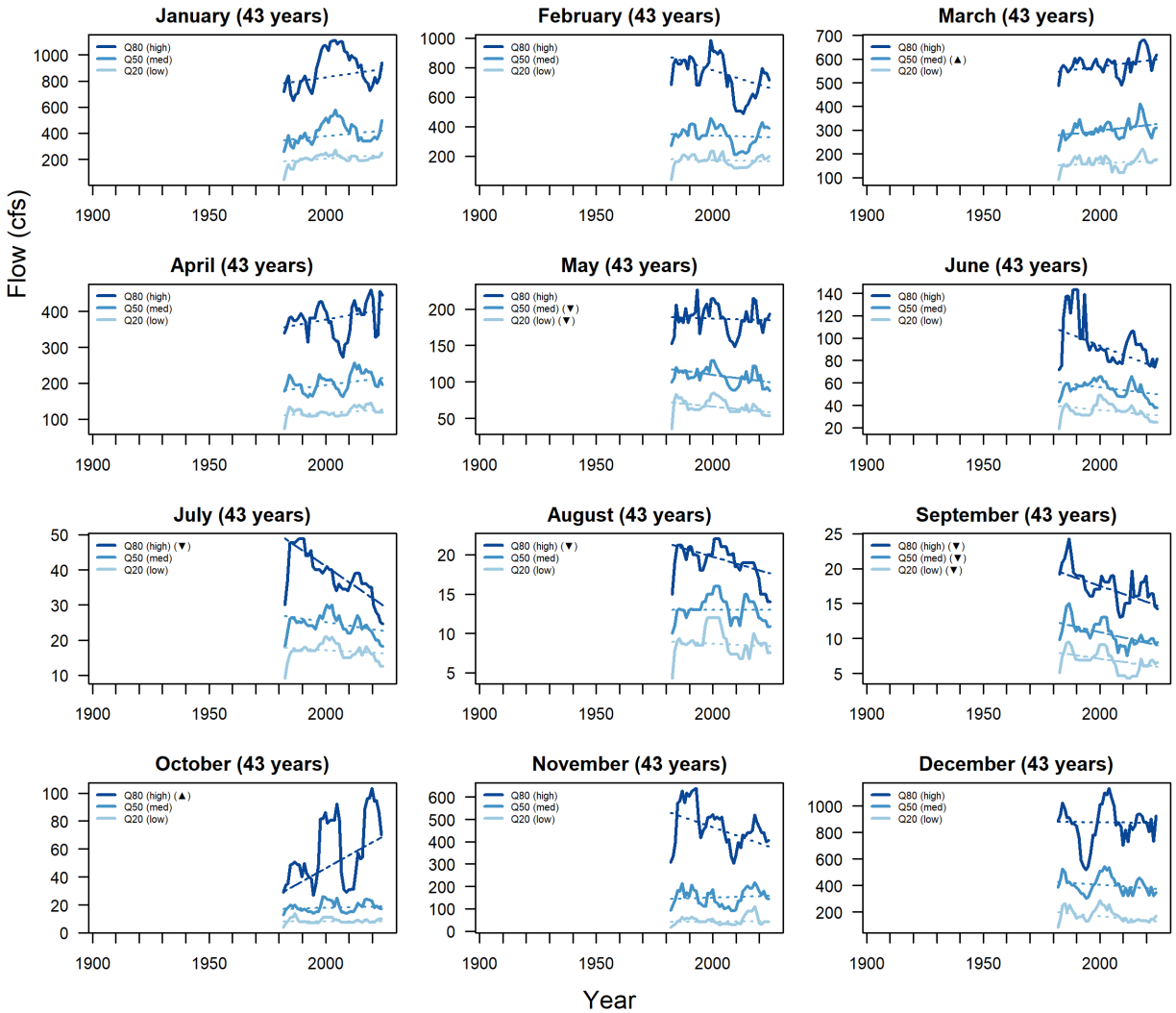
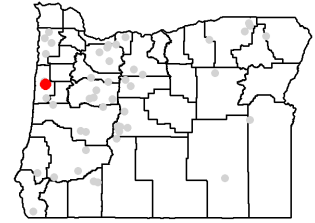


LT Flow Trends for Station #14306030

Annual Flow at Station #14306030 (43 years, 1982-2024)

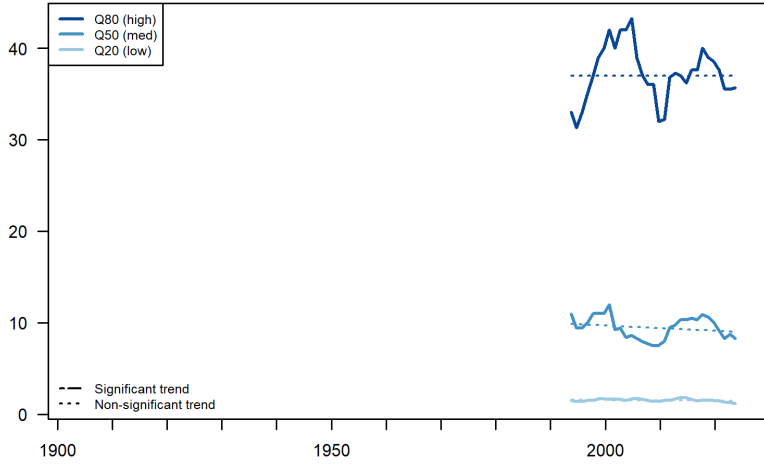


Station #14306030

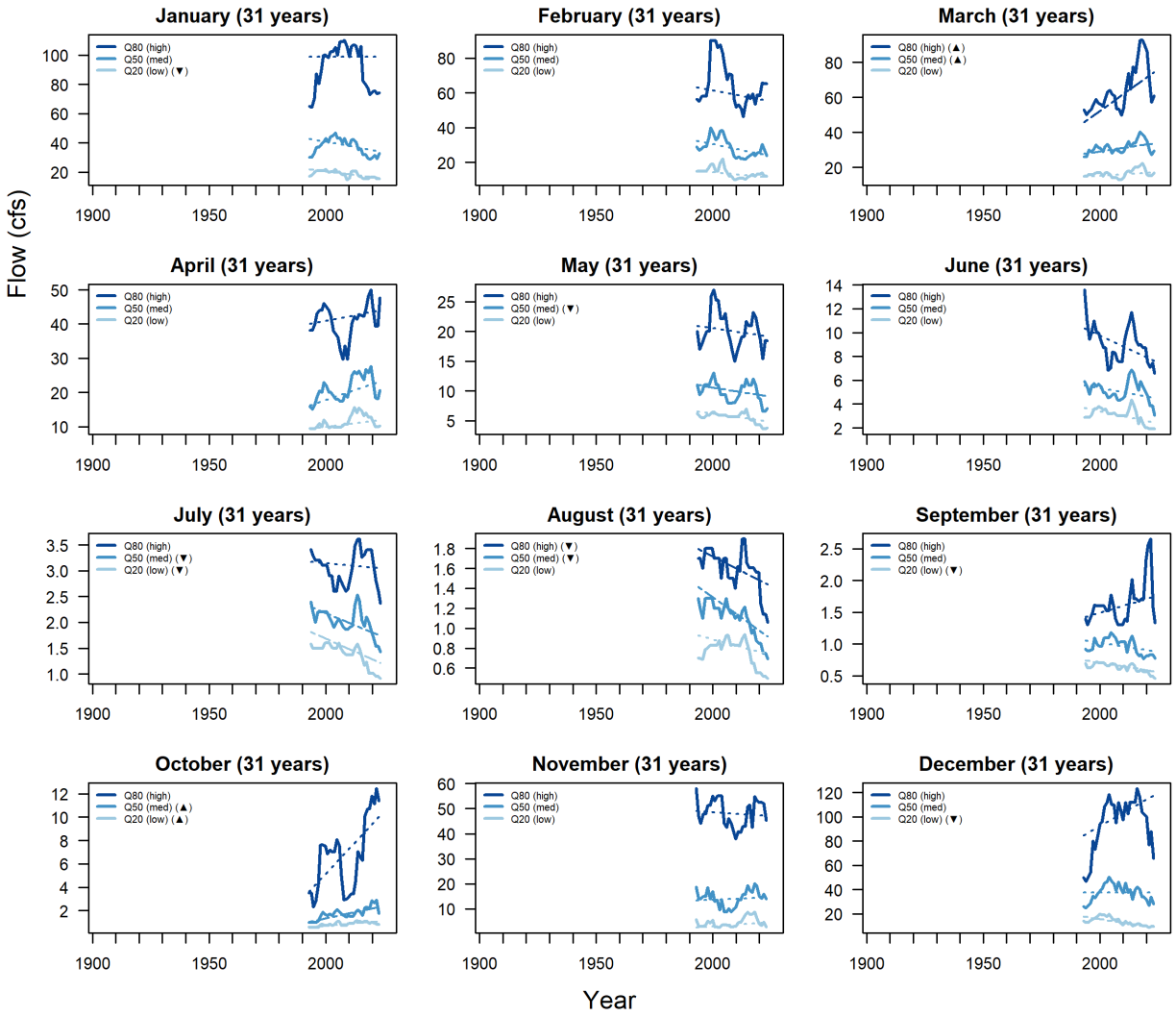
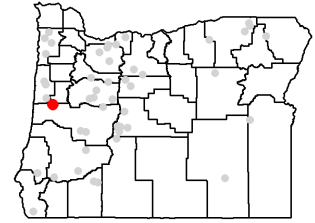


LT Flow Trends for Station #14306340

Annual Flow at Station #14306340 (31 years, 1993-2023)

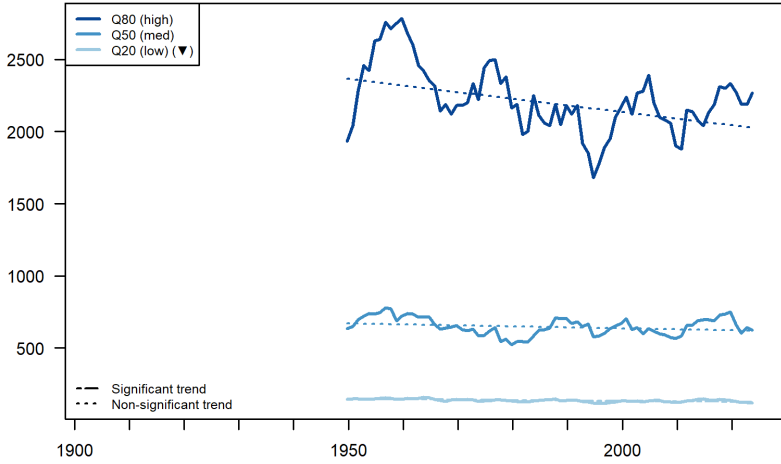


Station #14306340

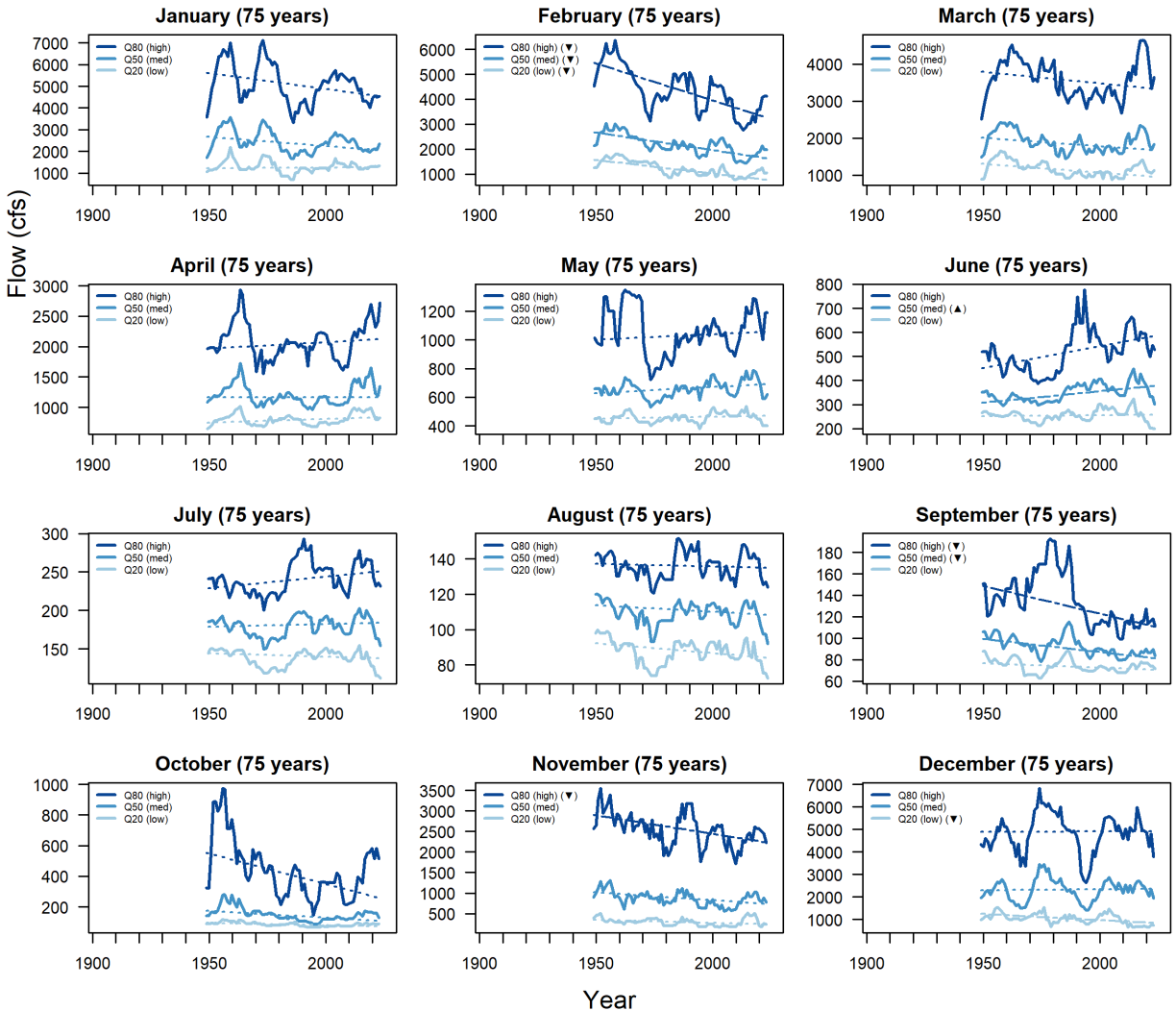
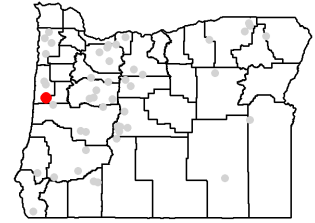


LT Flow Trends for Station #14306500

Annual Flow at Station #14306500 (75 years, 1949-2023)

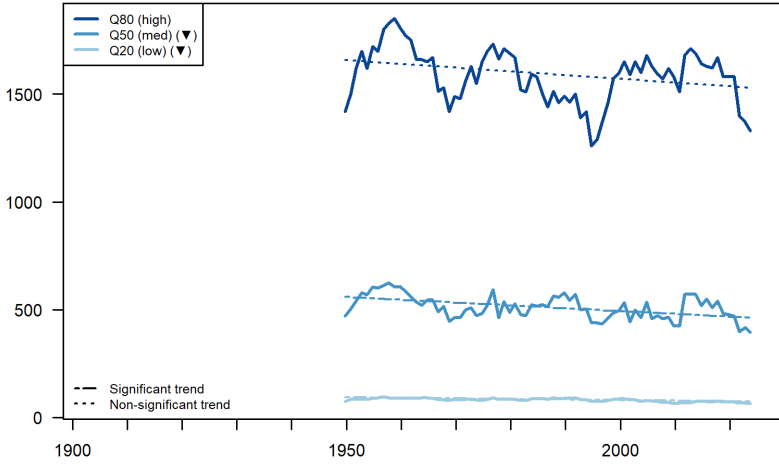


Station #14306500

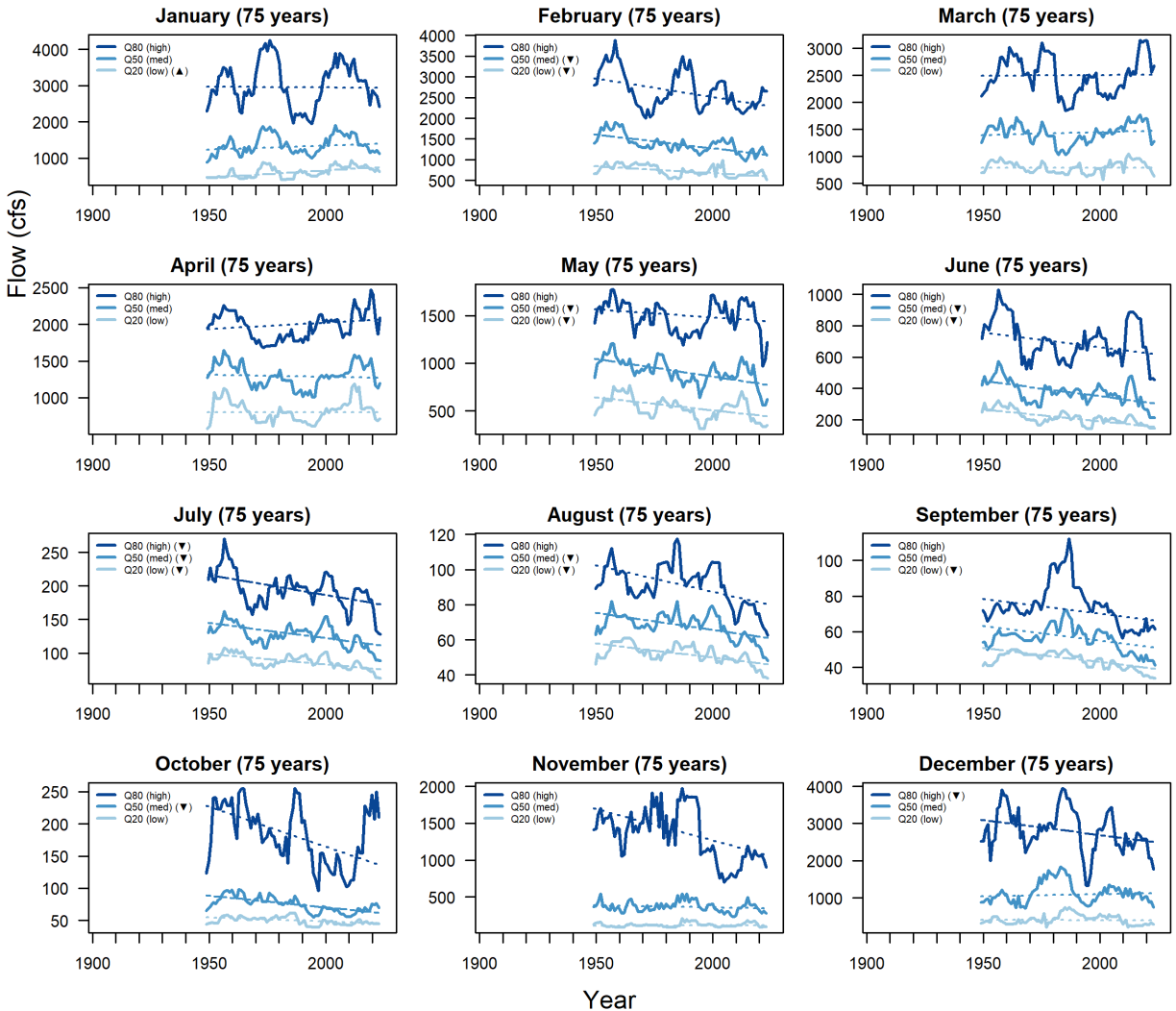
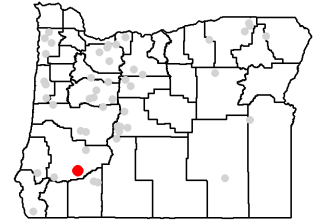


LT Flow Trends for Station #14308000

Annual Flow at Station #14308000 (75 years, 1949-2023)

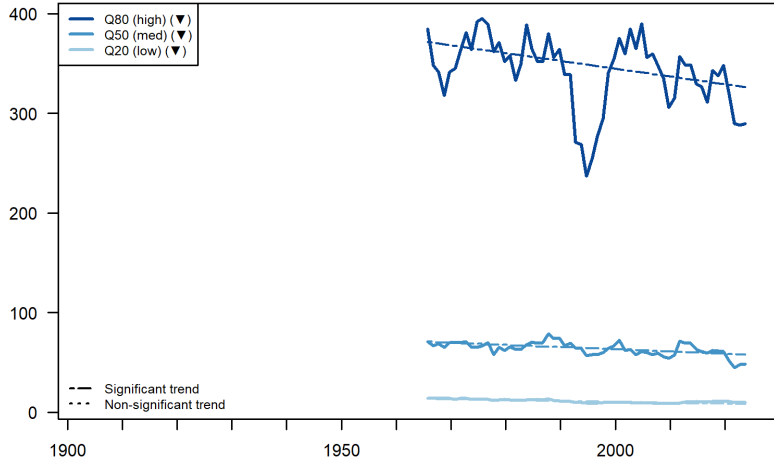


Station #14308000

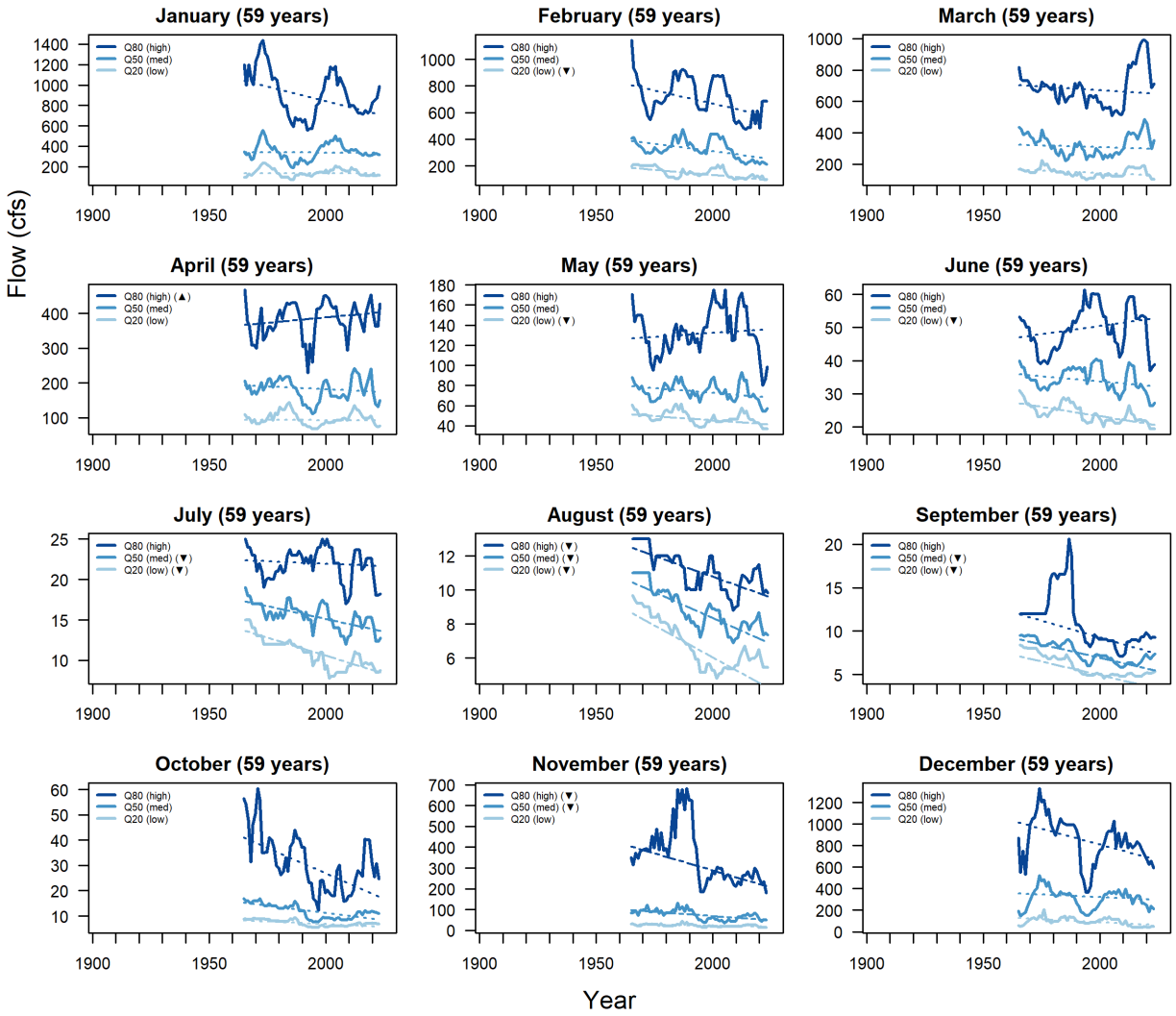
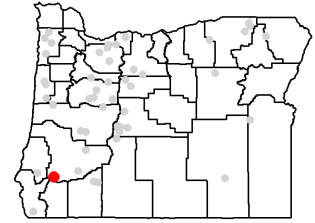


LT Flow Trends for Station #14309500

Annual Flow at Station #14309500 (59 years, 1965-2023)

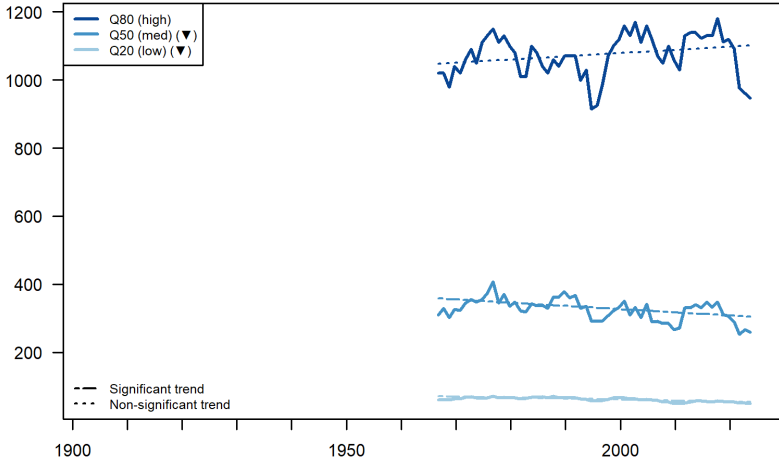


Station #14309500

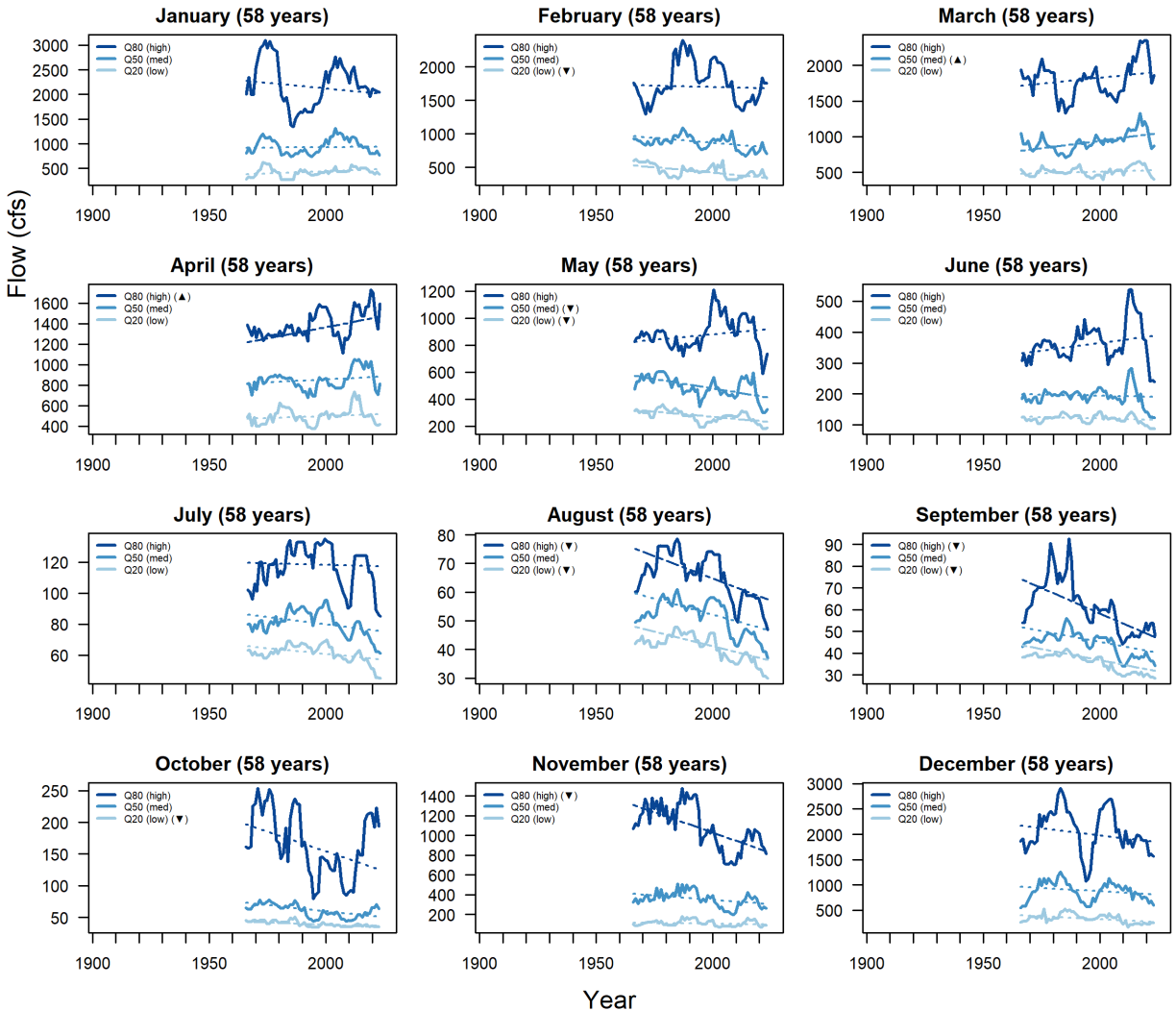
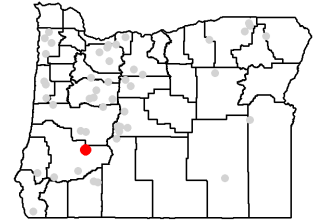


LT Flow Trends for Station #14316700

Annual Flow at Station #14316700 (58 years, 1966-2023)

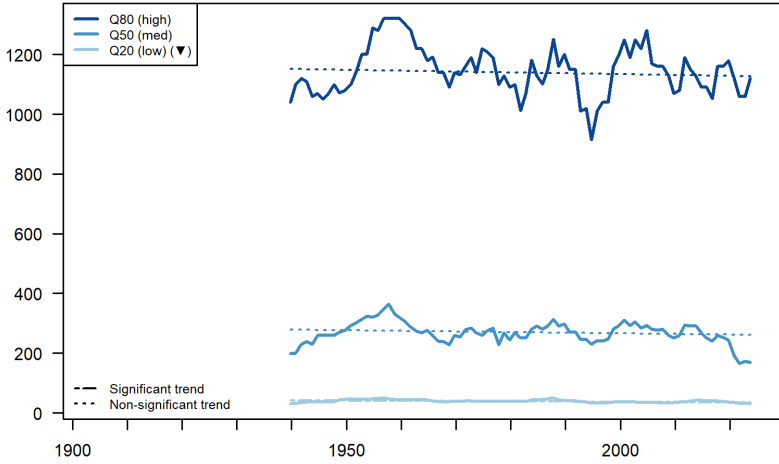


Station #14316700

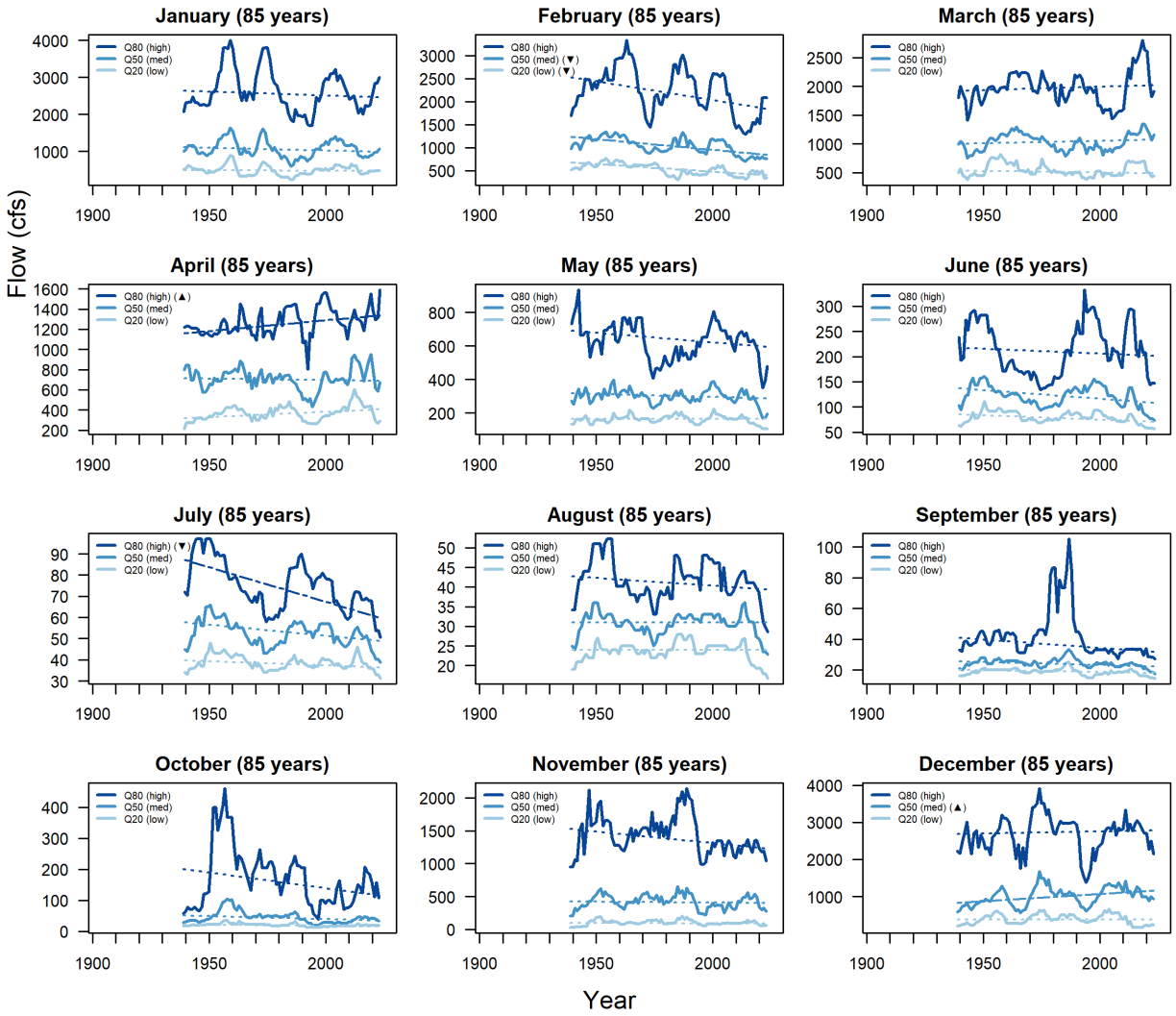
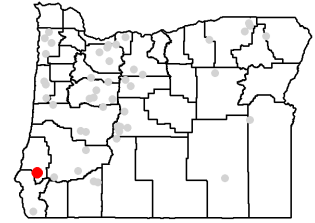


LT Flow Trends for Station #14325000

Annual Flow at Station #14325000 (85 years, 1939-2023)

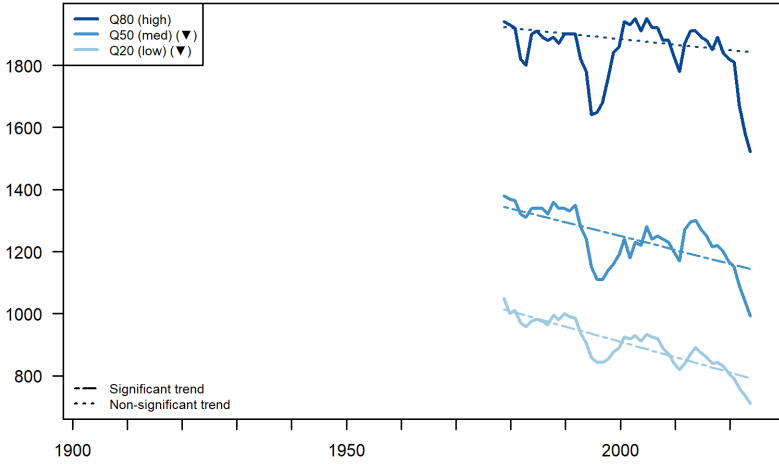


Station #14325000

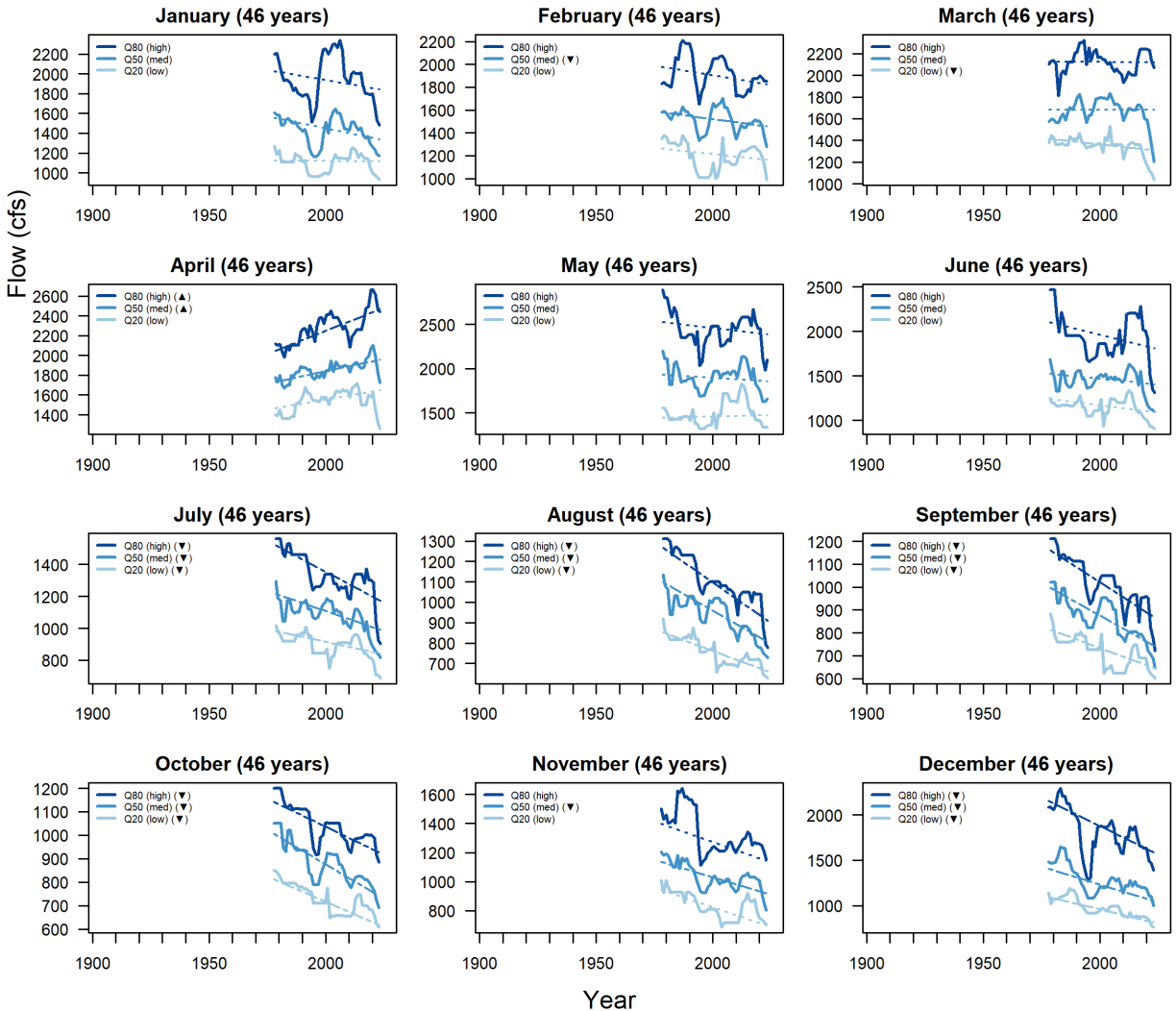
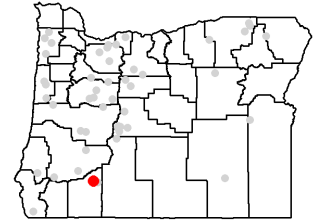


LT Flow Trends for Station #14330000

Annual Flow at Station #14330000 (46 years, 1978-2023)

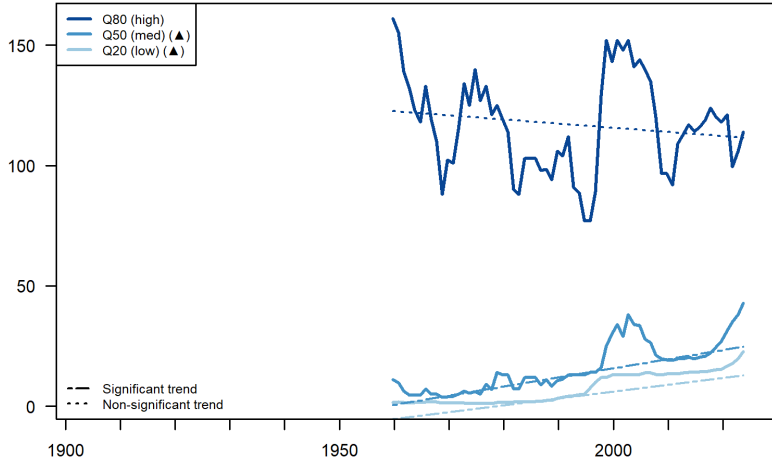


Station #14330000

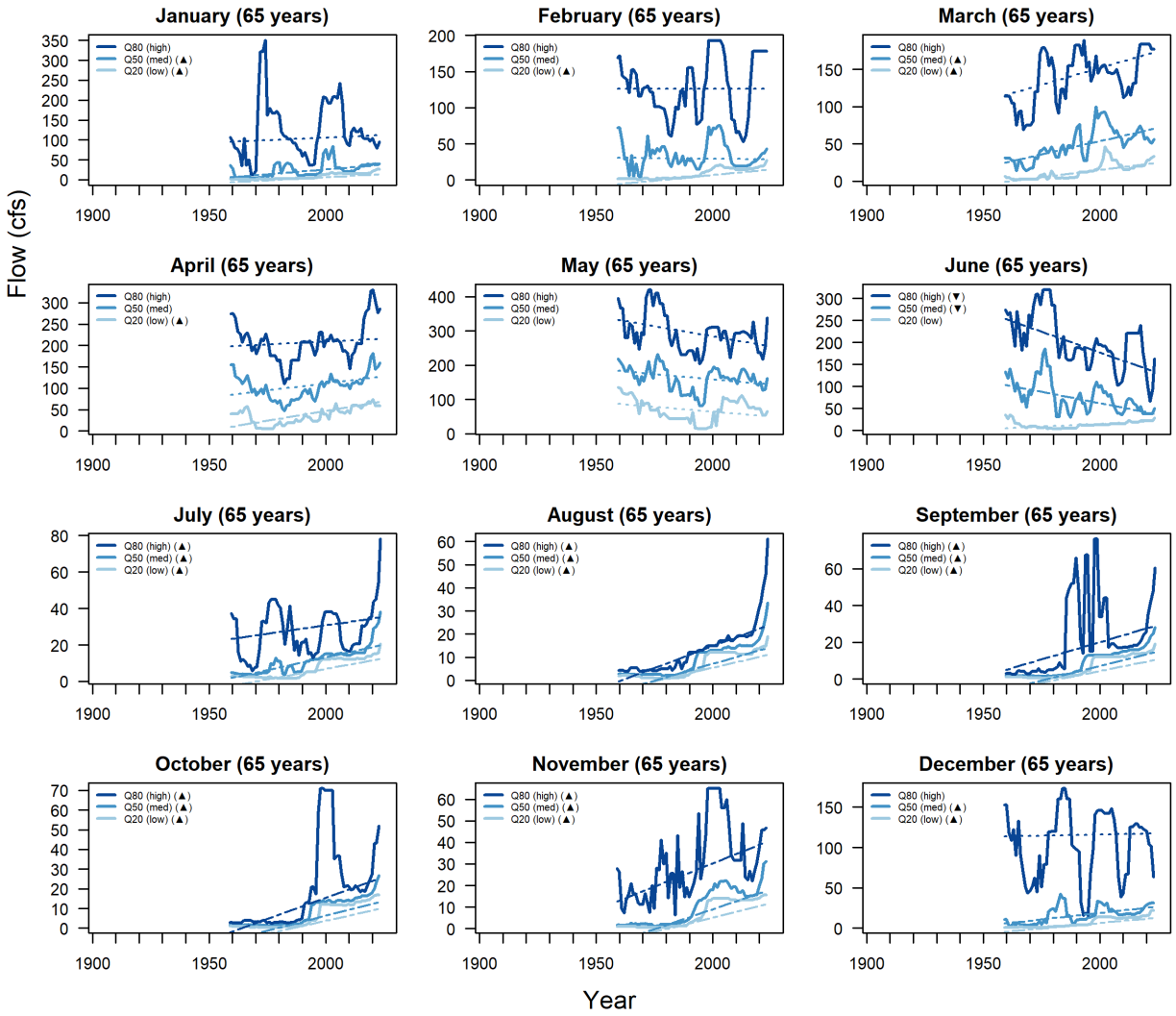
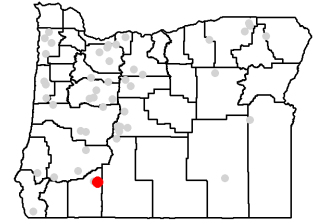


LT Flow Trends for Station #14332000

Annual Flow at Station #14332000 (65 years, 1959-2023)

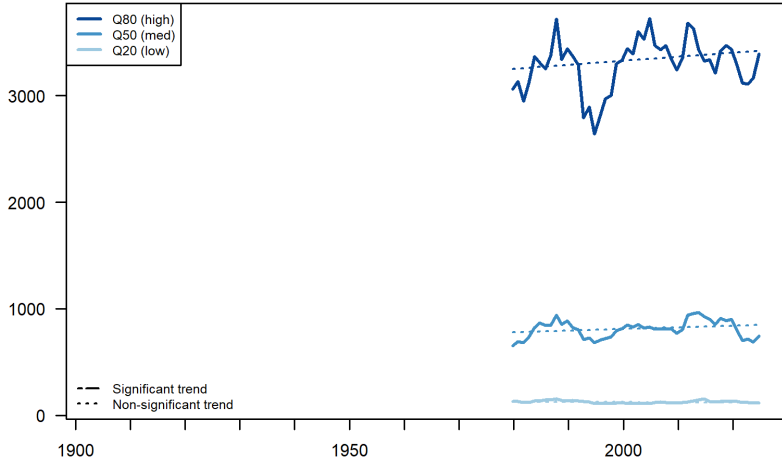


Station #14332000

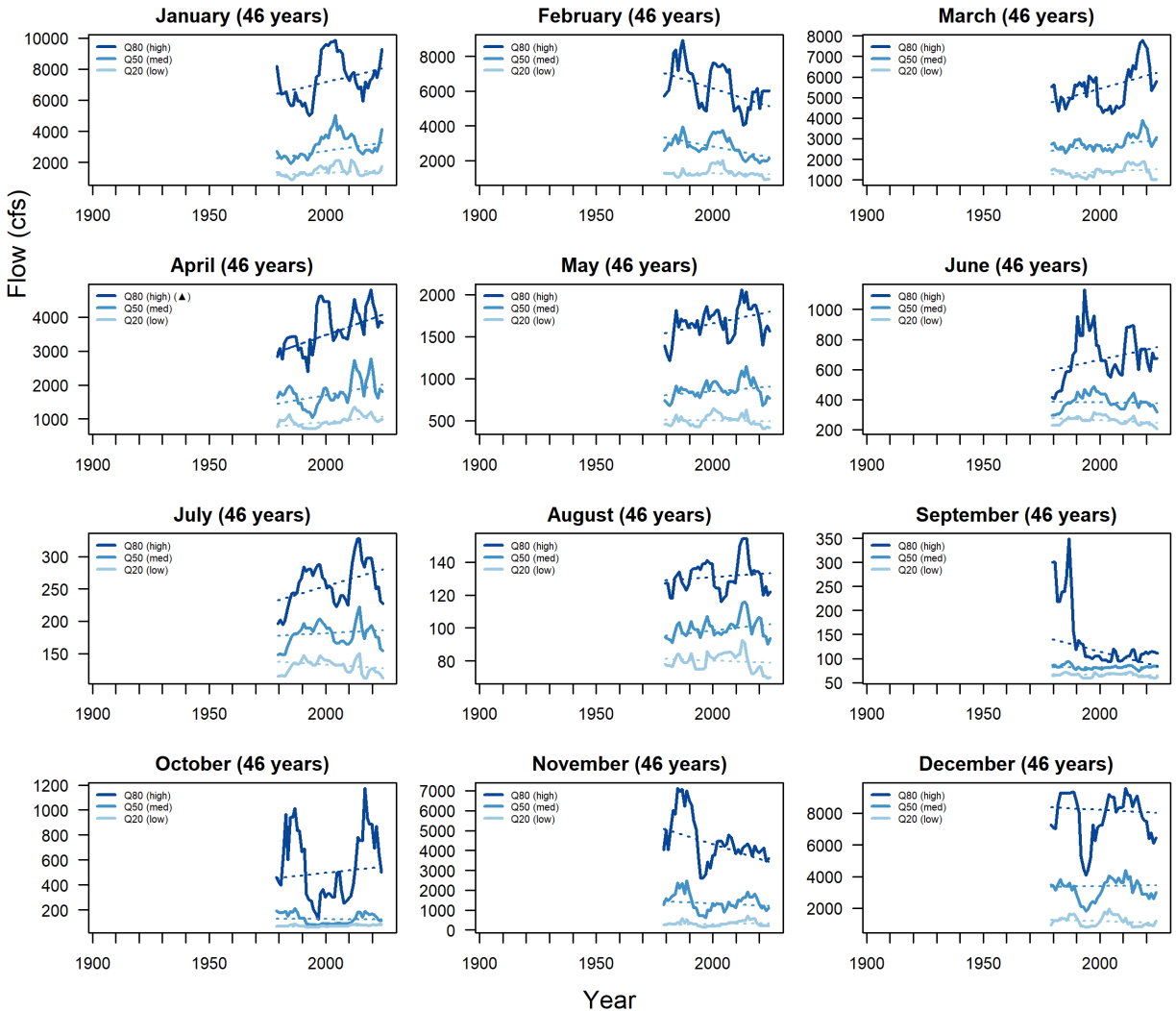
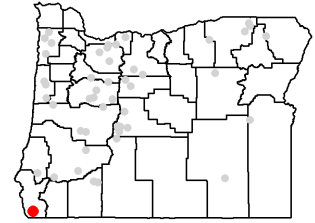


LT Flow Trends for Station #14400000

Annual Flow at Station #14400000 (46 years, 1979-2024)



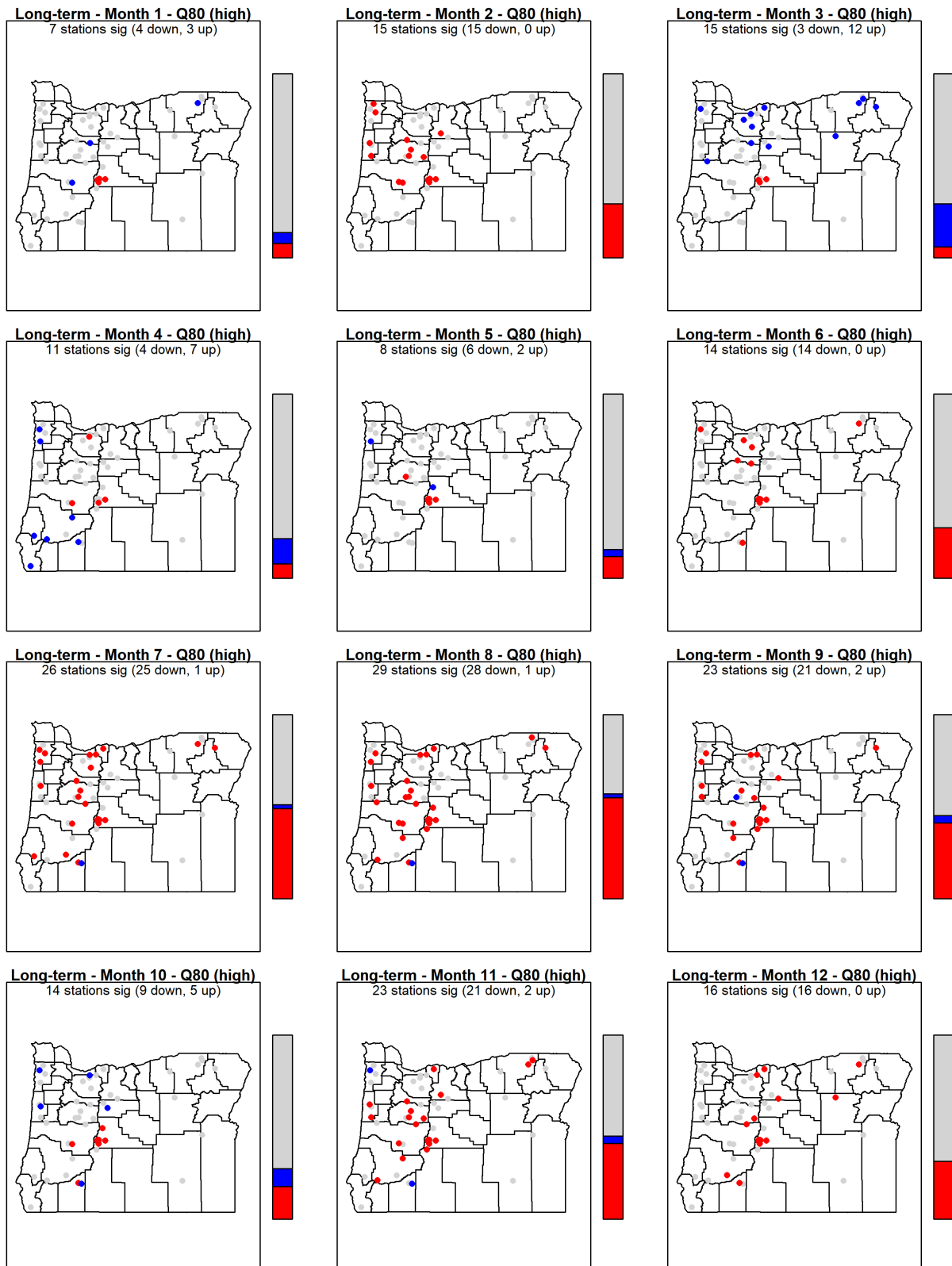
Station #14400000



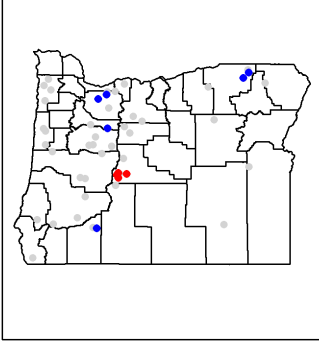
# Appendix J: Additional Maps – Moving Window Percentile Analysis – Long-term Period

Monthly maps of trend significance of mean monthly flow at 51 stations for 10-year moving window percentile analysis. Red (blue) indicates significant downward (upward) trend.

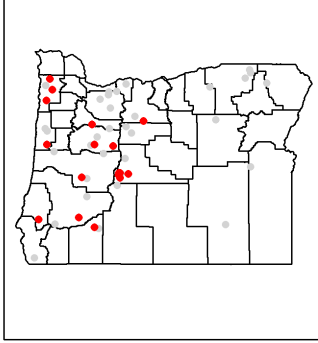
Record assessed ranges from 35 to 115 years.



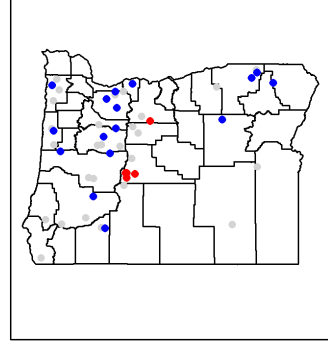
**Long-term - Month 1 - Q50 (med)**  
10 stations sig (4 down, 6 up)



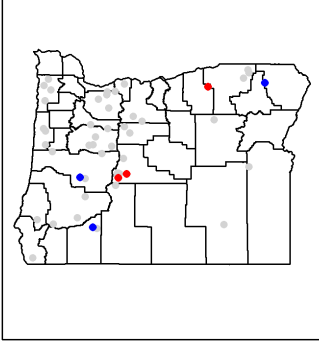
**Long-term - Month 2 - Q50 (med)**  
17 stations sig (17 down, 0 up)



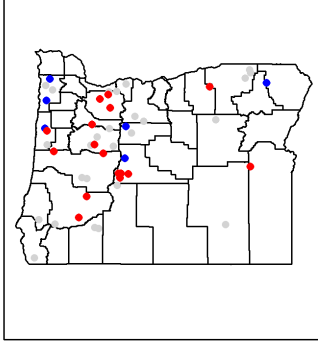
**Long-term - Month 3 - Q50 (med)**  
21 stations sig (5 down, 16 up)



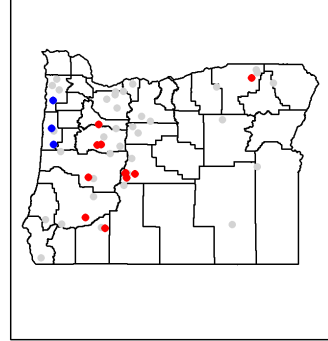
**Long-term - Month 4 - Q50 (med)**  
6 stations sig (3 down, 3 up)



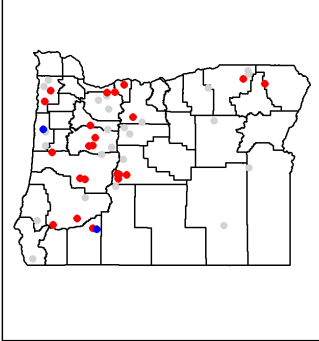
**Long-term - Month 5 - Q50 (med)**  
22 stations sig (16 down, 6 up)



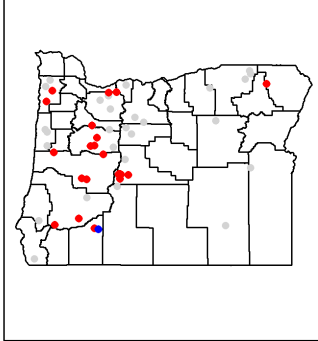
**Long-term - Month 6 - Q50 (med)**  
14 stations sig (11 down, 3 up)



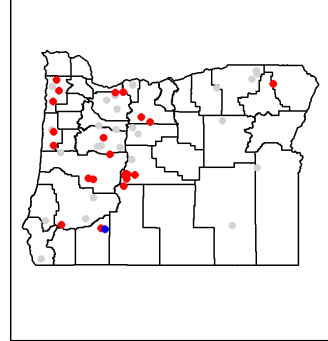
**Long-term - Month 7 - Q50 (med)**  
25 stations sig (23 down, 2 up)



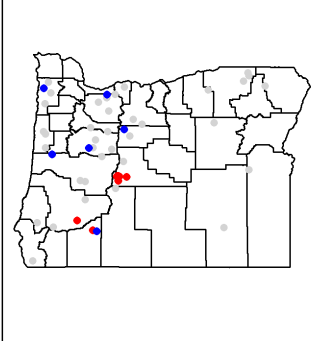
**Long-term - Month 8 - Q50 (med)**  
23 stations sig (22 down, 1 up)



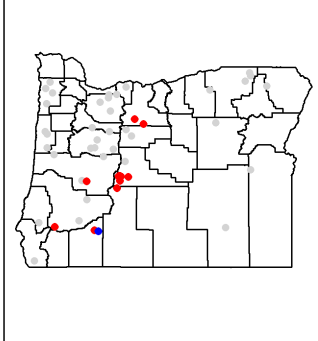
**Long-term - Month 9 - Q50 (med)**  
25 stations sig (24 down, 1 up)



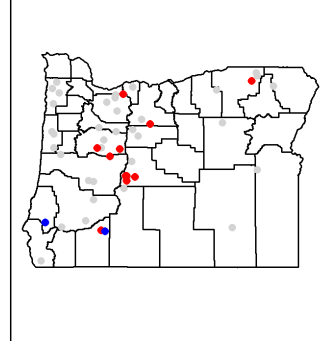
**Long-term - Month 10 - Q50 (med)**  
14 stations sig (8 down, 6 up)



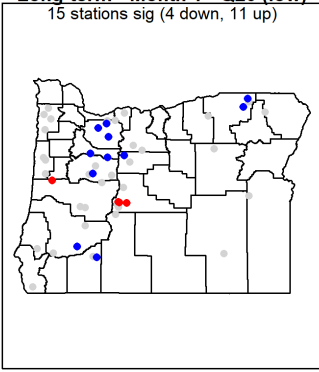
**Long-term - Month 11 - Q50 (med)**  
13 stations sig (12 down, 1 up)



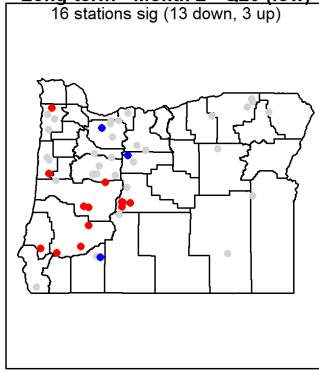
**Long-term - Month 12 - Q50 (med)**  
13 stations sig (11 down, 2 up)



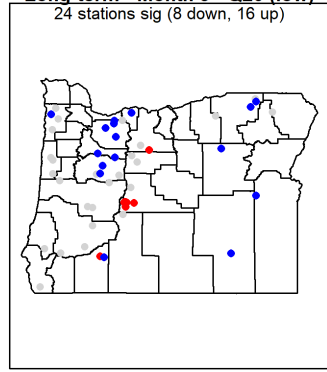
**Long-term - Month 1 - Q20 (low)**  
15 stations sig (4 down, 11 up)



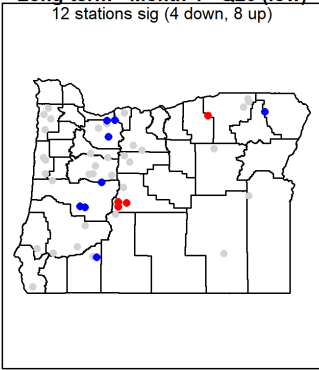
**Long-term - Month 2 - Q20 (low)**  
16 stations sig (13 down, 3 up)



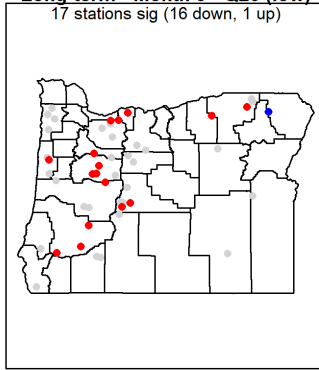
**Long-term - Month 3 - Q20 (low)**  
24 stations sig (8 down, 16 up)



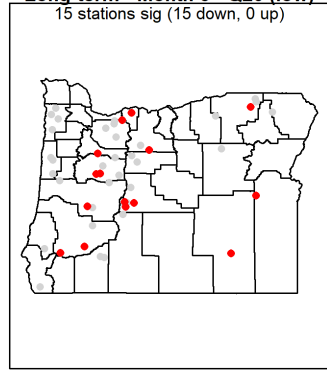
**Long-term - Month 4 - Q20 (low)**  
12 stations sig (4 down, 8 up)



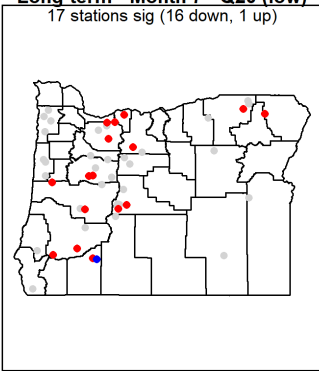
**Long-term - Month 5 - Q20 (low)**  
17 stations sig (16 down, 1 up)



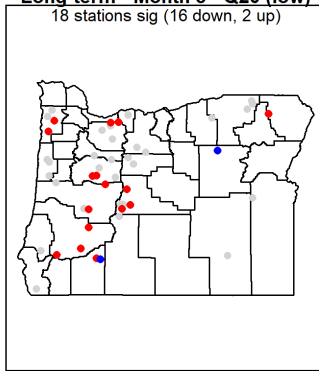
**Long-term - Month 6 - Q20 (low)**  
15 stations sig (15 down, 0 up)



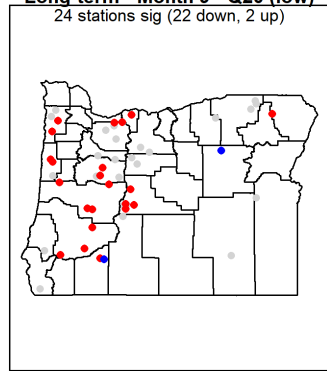
**Long-term - Month 7 - Q20 (low)**  
17 stations sig (16 down, 1 up)



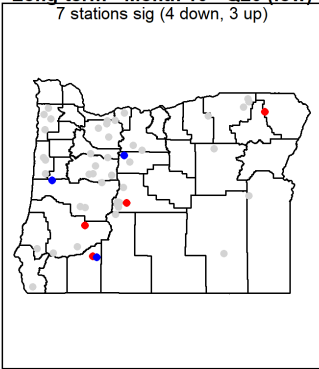
**Long-term - Month 8 - Q20 (low)**  
18 stations sig (16 down, 2 up)



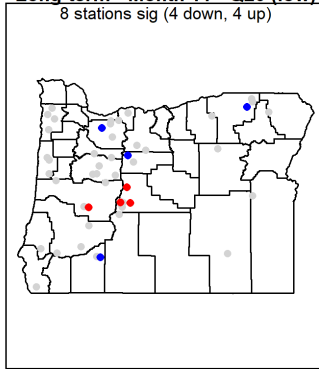
**Long-term - Month 9 - Q20 (low)**  
24 stations sig (22 down, 2 up)



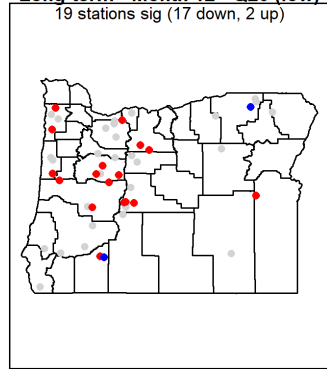
**Long-term - Month 10 - Q20 (low)**  
7 stations sig (4 down, 3 up)



**Long-term - Month 11 - Q20 (low)**  
8 stations sig (4 down, 4 up)



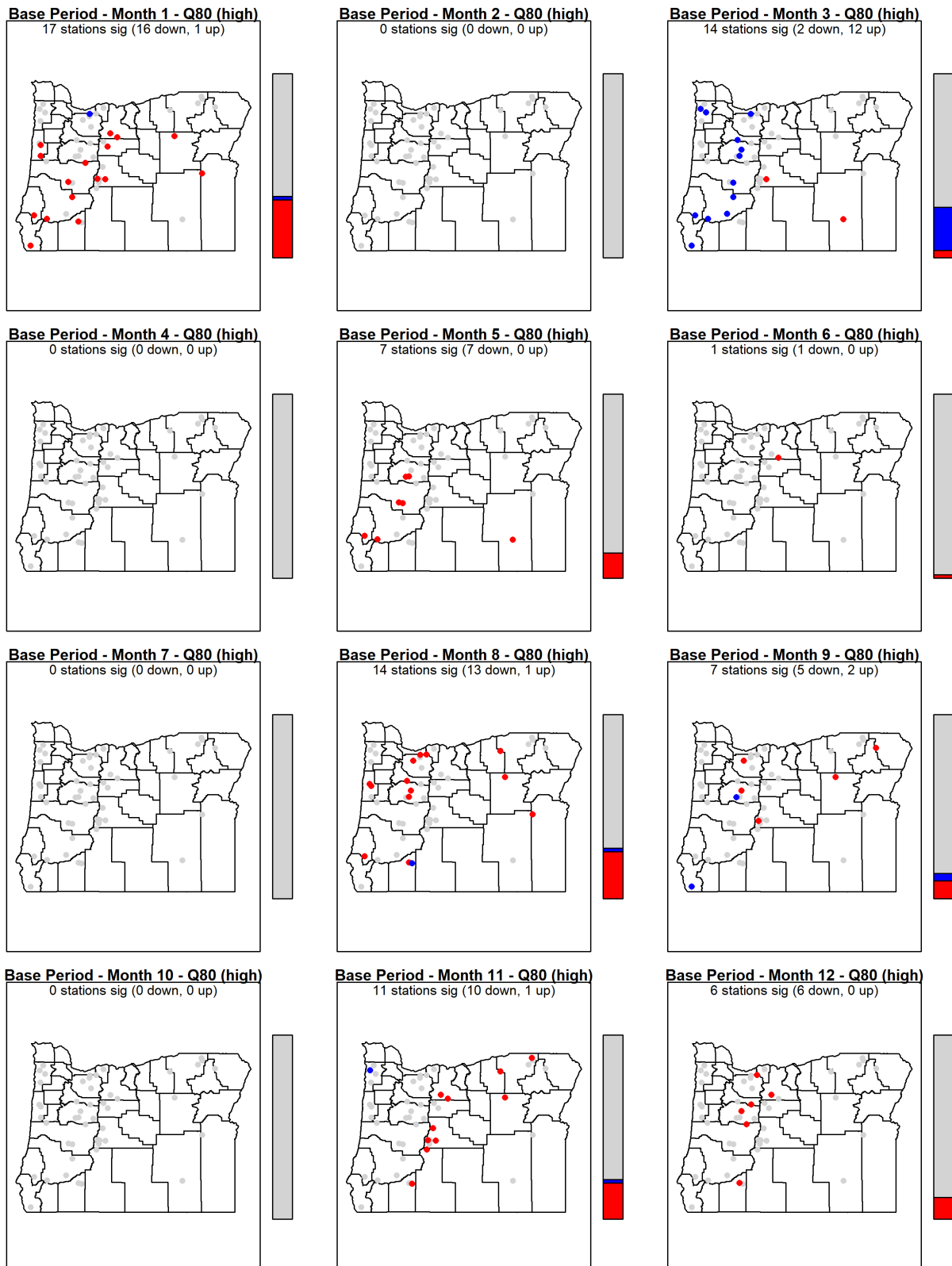
**Long-term - Month 12 - Q20 (low)**  
19 stations sig (17 down, 2 up)



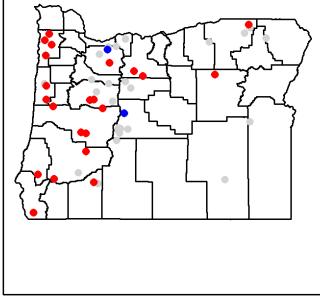
# Appendix K: Additional Maps – Moving Window Percentile Analysis – Base Period

Monthly maps of trend significance of mean monthly flow at 51 stations for 10-year moving window percentile analysis. Red (blue) indicates significant downward (upward) trend.

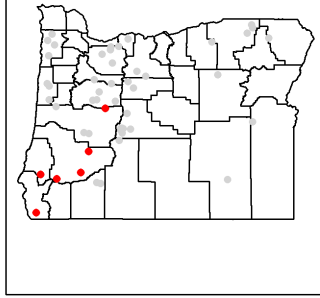
Record assessed ranges from water years 1991-2020.



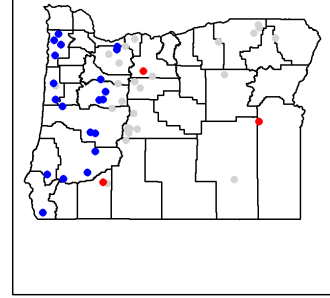
**Base Period - Month 1 - Q50 (med)**  
24 stations sig (22 down, 2 up)



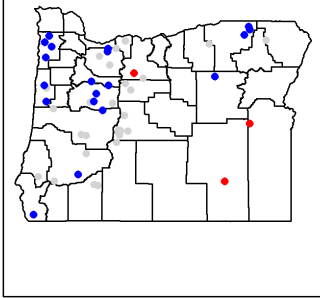
**Base Period - Month 2 - Q50 (med)**  
6 stations sig (6 down, 0 up)



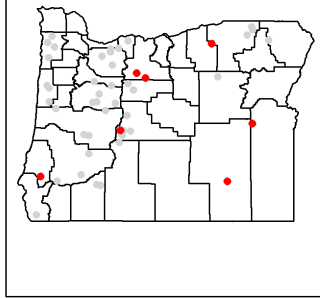
**Base Period - Month 3 - Q50 (med)**  
23 stations sig (3 down, 20 up)



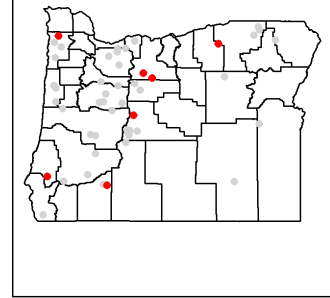
**Base Period - Month 4 - Q50 (med)**  
22 stations sig (3 down, 19 up)



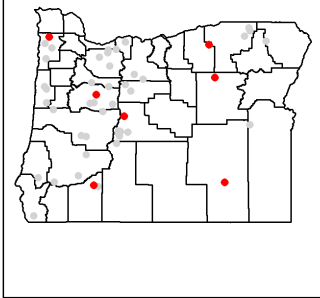
**Base Period - Month 5 - Q50 (med)**  
7 stations sig (7 down, 0 up)



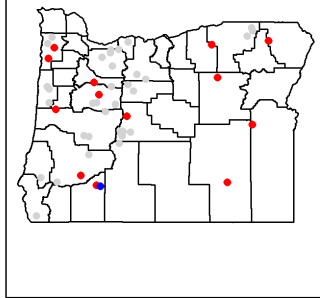
**Base Period - Month 6 - Q50 (med)**  
7 stations sig (7 down, 0 up)



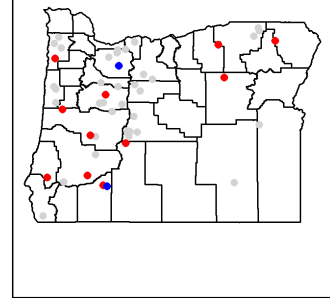
**Base Period - Month 7 - Q50 (med)**  
7 stations sig (7 down, 0 up)



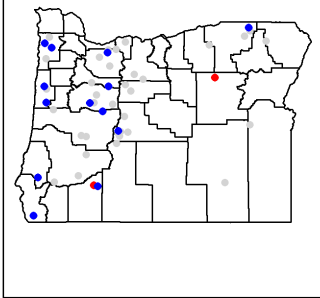
**Base Period - Month 8 - Q50 (med)**  
14 stations sig (13 down, 1 up)



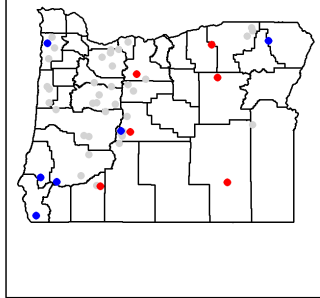
**Base Period - Month 9 - Q50 (med)**  
13 stations sig (11 down, 2 up)



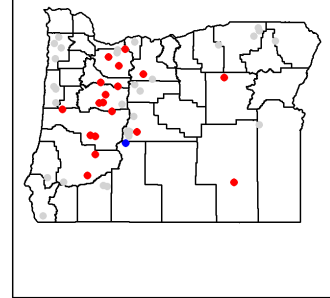
**Base Period - Month 10 - Q50 (med)**  
15 stations sig (2 down, 13 up)



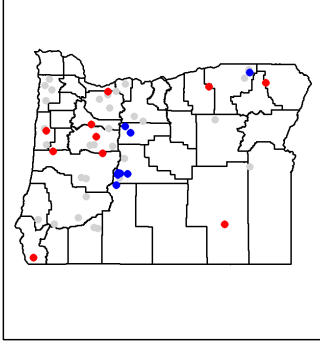
**Base Period - Month 11 - Q50 (med)**  
12 stations sig (6 down, 6 up)



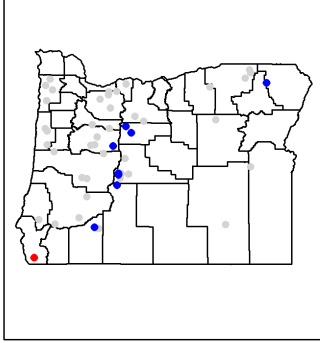
**Base Period - Month 12 - Q50 (med)**  
19 stations sig (18 down, 1 up)



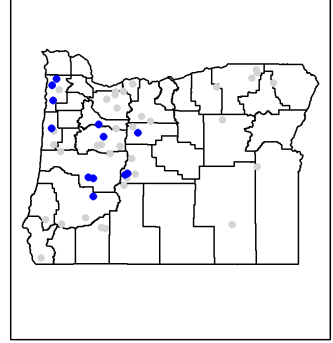
**Base Period - Month 1 - Q20 (low)**  
19 stations sig (10 down, 9 up)



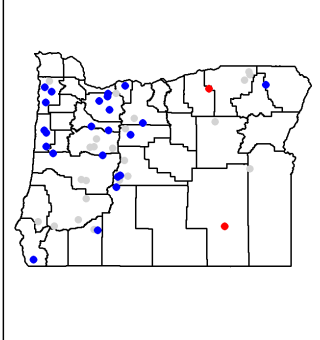
**Base Period - Month 2 - Q20 (low)**  
9 stations sig (1 down, 8 up)



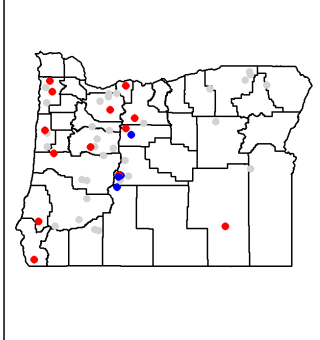
**Base Period - Month 3 - Q20 (low)**  
12 stations sig (0 down, 12 up)



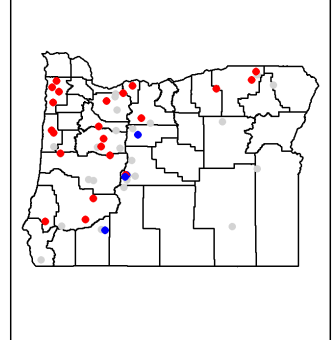
**Base Period - Month 4 - Q20 (low)**  
25 stations sig (2 down, 23 up)



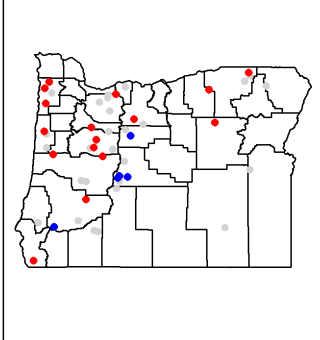
**Base Period - Month 5 - Q20 (low)**  
18 stations sig (13 down, 5 up)



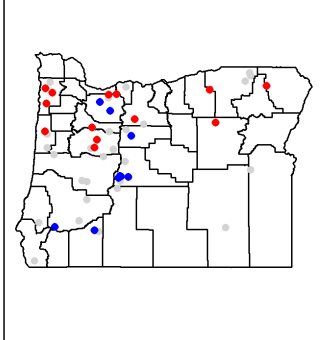
**Base Period - Month 6 - Q20 (low)**  
26 stations sig (22 down, 4 up)



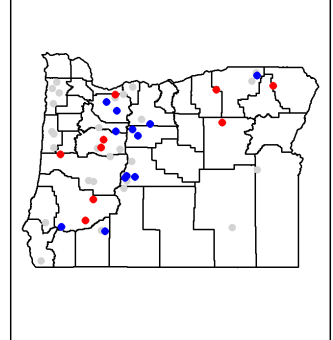
**Base Period - Month 7 - Q20 (low)**  
21 stations sig (16 down, 5 up)



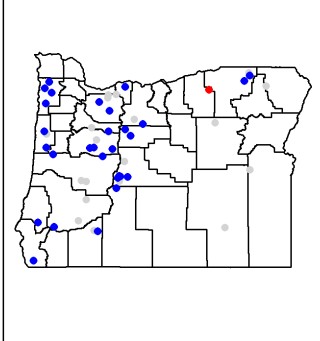
**Base Period - Month 8 - Q20 (low)**  
22 stations sig (13 down, 9 up)



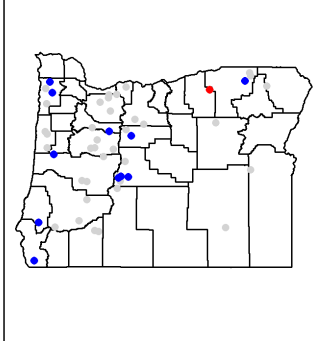
**Base Period - Month 9 - Q20 (low)**  
21 stations sig (9 down, 12 up)



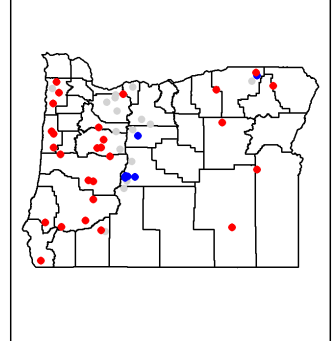
**Base Period - Month 10 - Q20 (low)**  
30 stations sig (1 down, 29 up)



**Base Period - Month 11 - Q20 (low)**  
12 stations sig (1 down, 11 up)



**Base Period - Month 12 - Q20 (low)**  
34 stations sig (27 down, 7 up)



# Appendix L: Additional Non-Stationarity Analyses Results

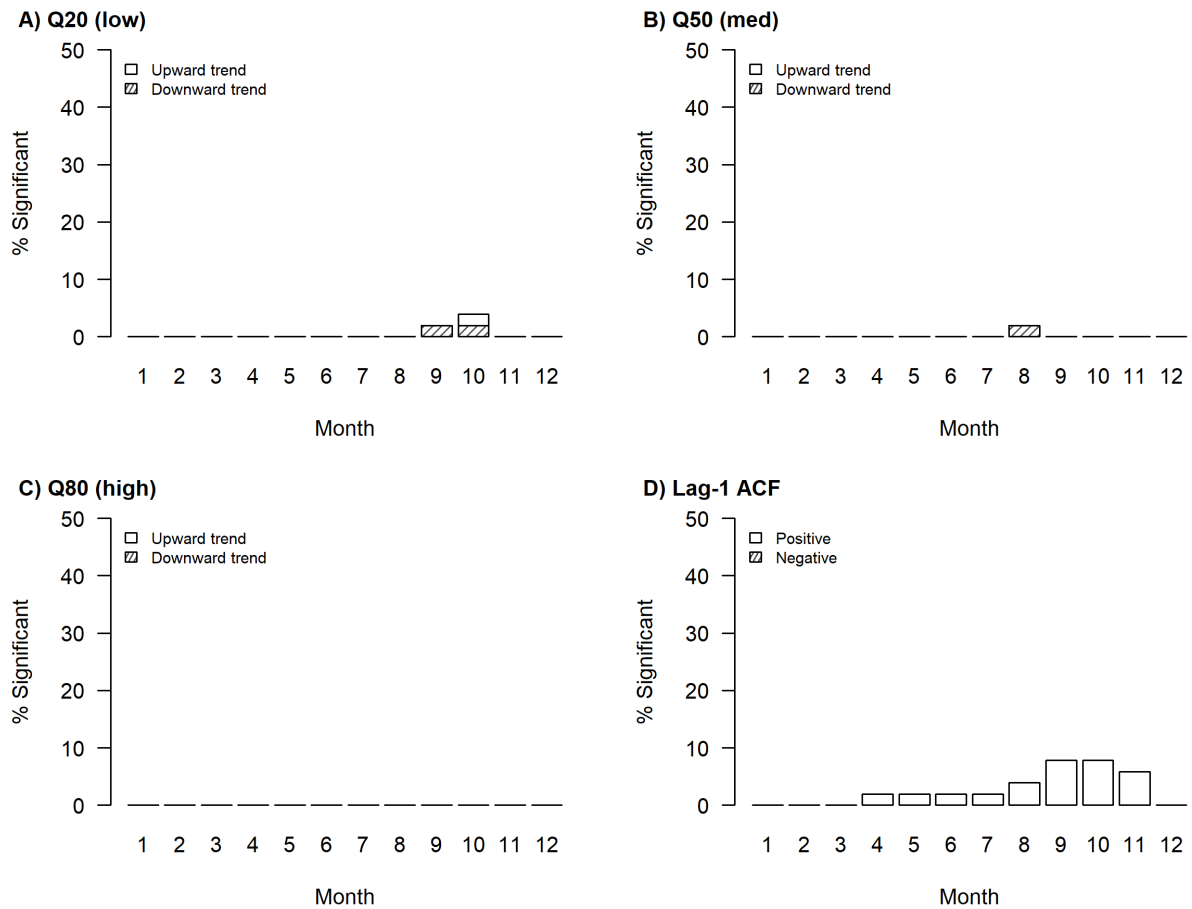


Figure L1. Percentage of 51 stations with significant quantile regression results for A) Q80, B) Q50, C) Q20, and D) lag-1 autocorrelation of mean monthly flow for the base period (1991-2020).

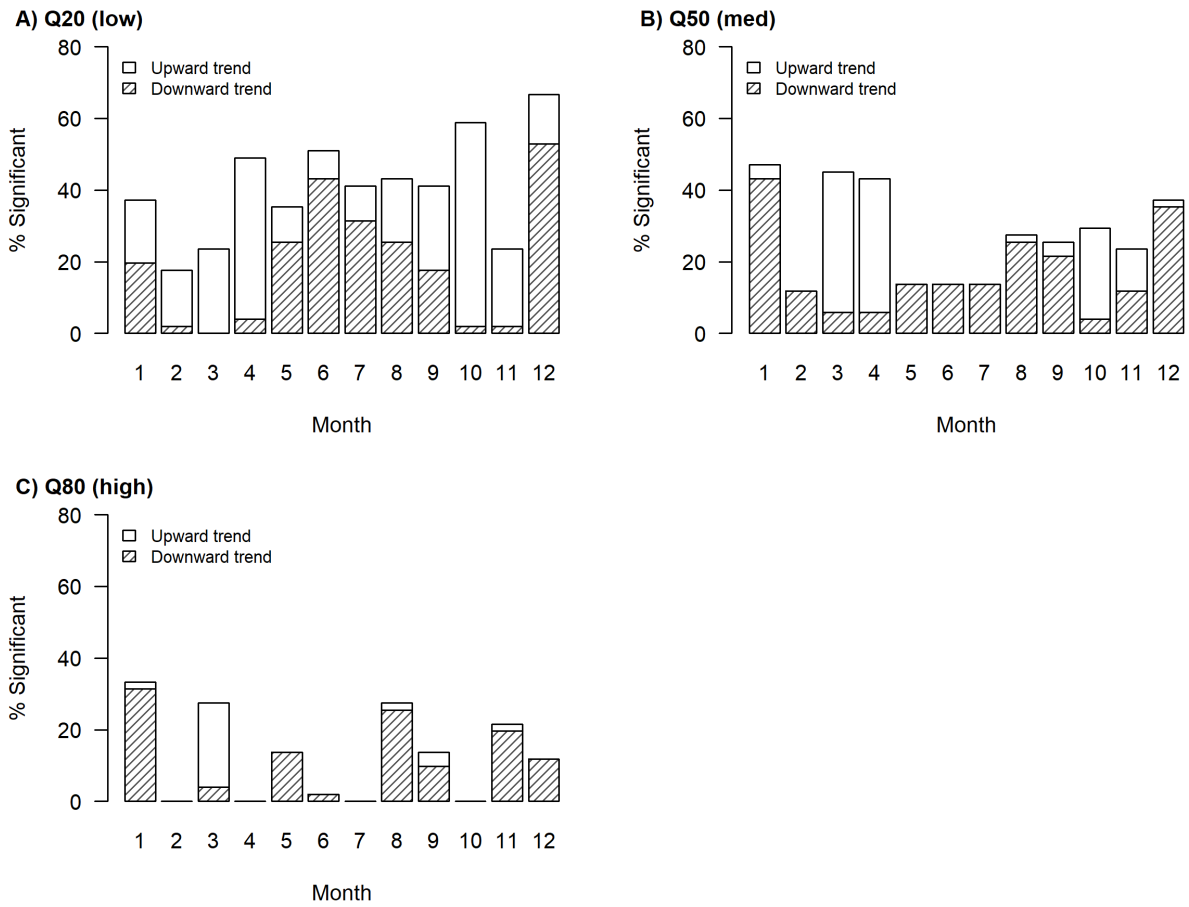


Figure L2. Percentage of 51 stations with significant moving window percentile trend results for A) Q20 (low), B) Q50 (med), C) Q80 (high) of mean monthly flow, and D) summer (July to September) mean monthly flow percentiles for the base period (1991-2020).

## Appendix M: Oregon Ecoregions & Hydrologic Classes



Figure E1. From Sanborn and Bledsoe (2006): “USGS reference gauges classified by the ‘all-flow’ regime types superimposed on level 3 ecoregions.”

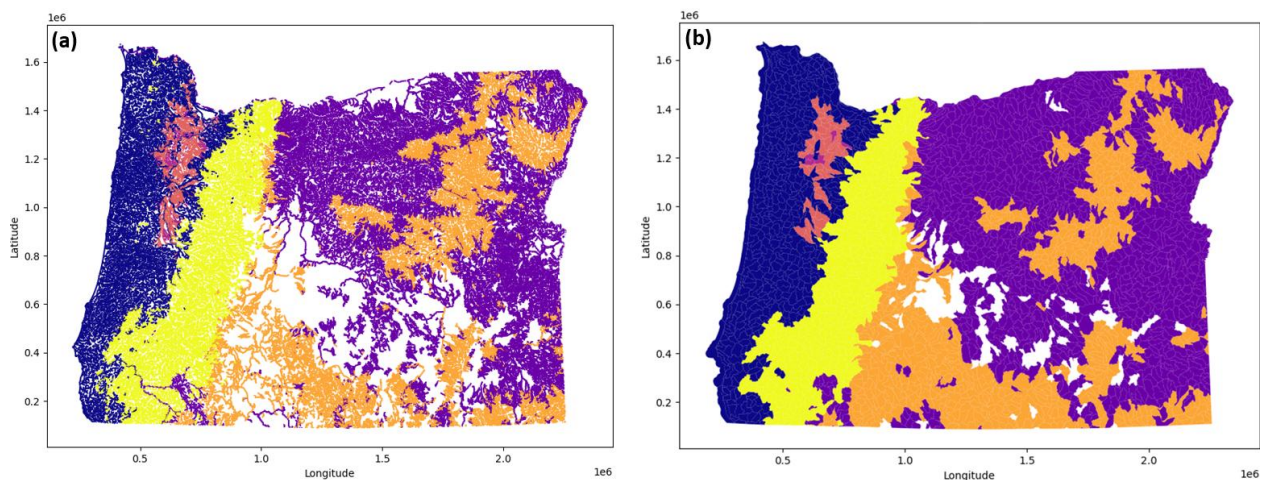


Figure E2. From Andrews and Huang (2024): “Classifications for (a) stream segments and (b) HUC12 sub-watersheds.”