Assignment 11 (ABE651)
Presentation Graphics

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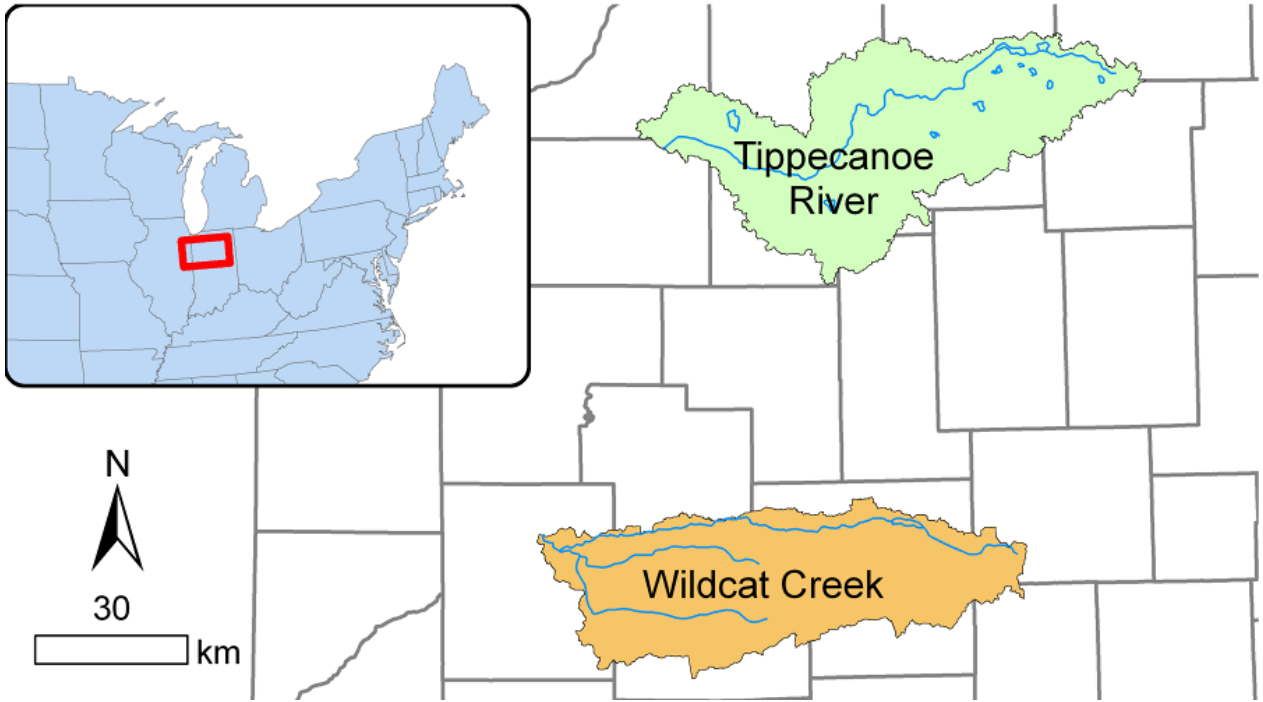
Github: https://github.com/Environmental-Informatics/11-presentation-graphics-roccabye

Environmental Metrics and Descriptive Statistics for two USGS stream gauges.

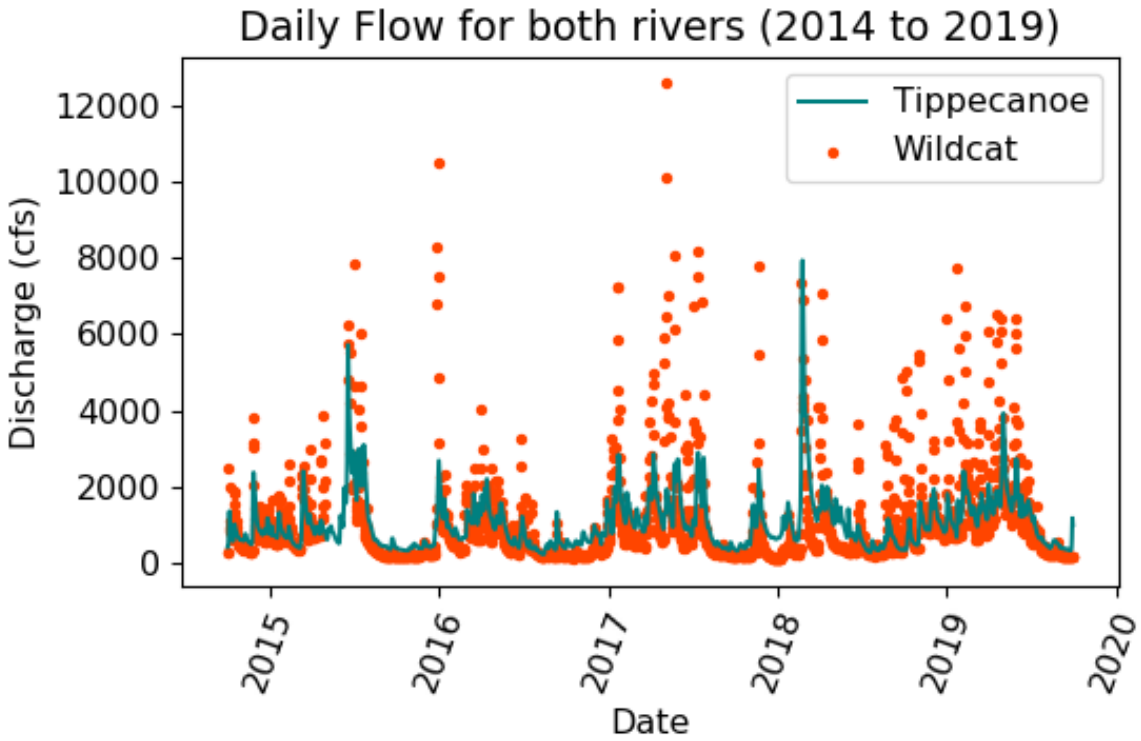
(USGS 03331500 TIPPECANOE RIVER NEAR ORA, IN and USGS 03335000 WILDCAT CREEK NEAR LAFAYETTE, IN in Central Indiana.)

Location map of USGS stream gauge in Central Indiana
source: Assignment 11, Environmental Informatics github repository



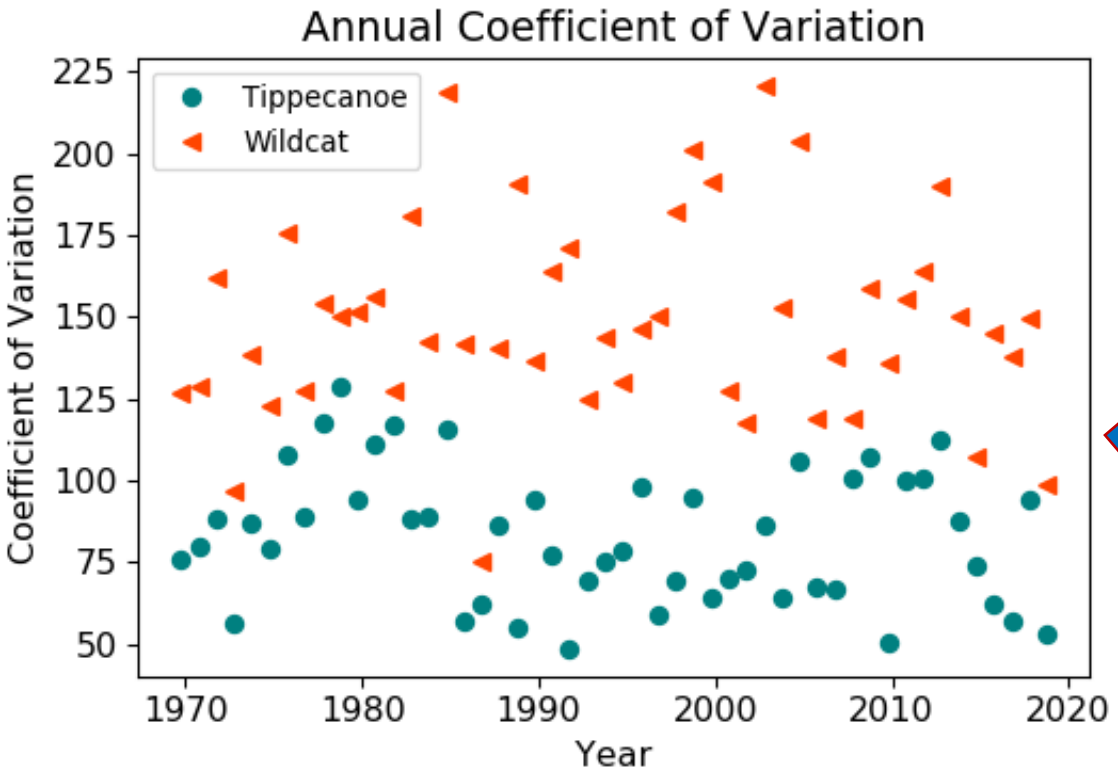
https://github.com/Environmental-Informatics/11-presentation-graphics-roccabye#assignment-11---presentation-graphics.

Time series of daily discharge (cfs) at both the gauges;
Tippecanoe River and Wildcat Creek for past five years.



Note: For Wildcat Creek there is a gap period in 2015 when no data is recorded.
The variation in the peak discharge value is huge between two gauges.

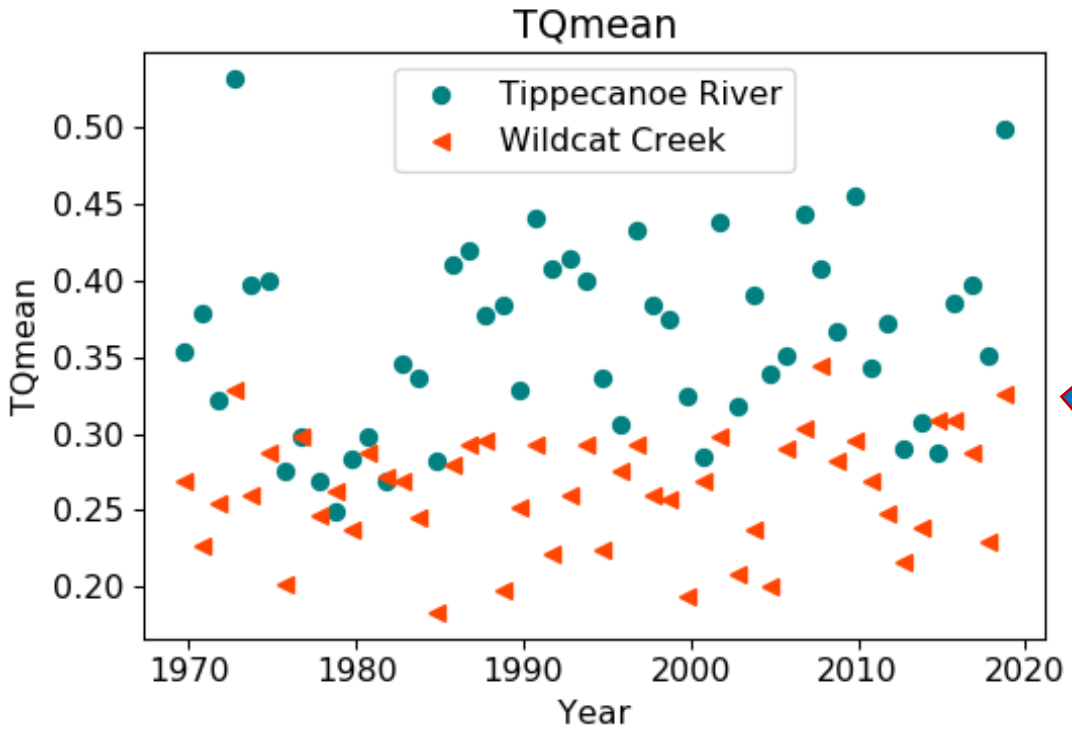
Annual mean Coefficient of Variation for the two stream gauges.



Comparisons are done for the period 1969 - 2019

Annual mean T-Qmean for the two stream gauges.

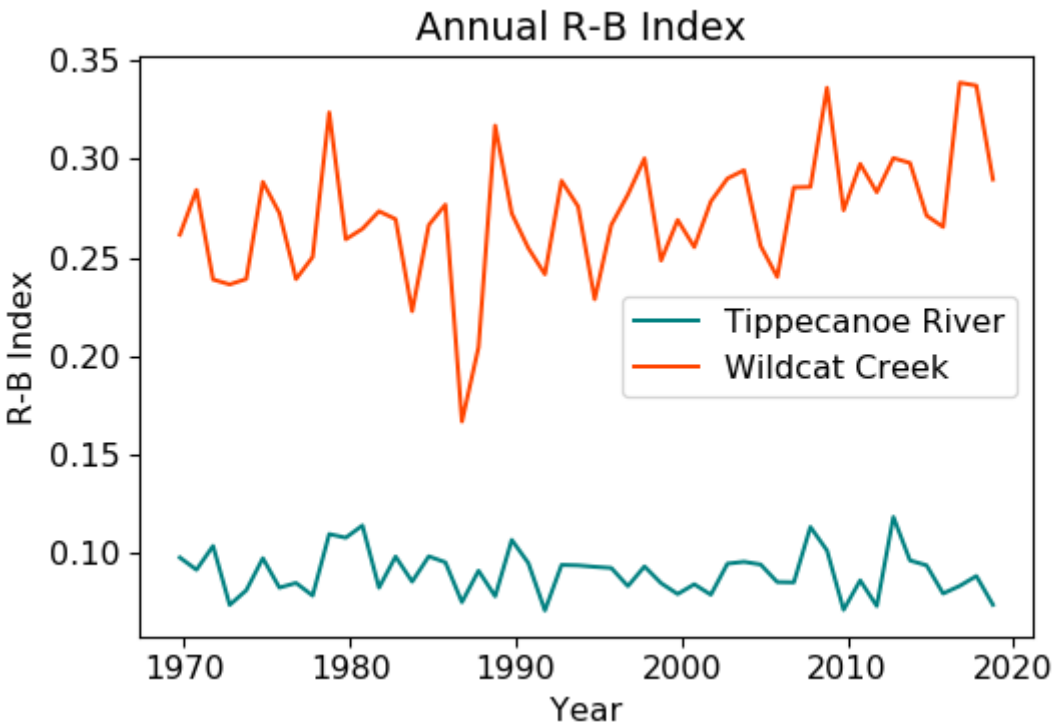
TQmean is the fraction of time that daily streamflow exceeds mean streamflow for each year.



Comparisons are done for the period 1969 - 2019

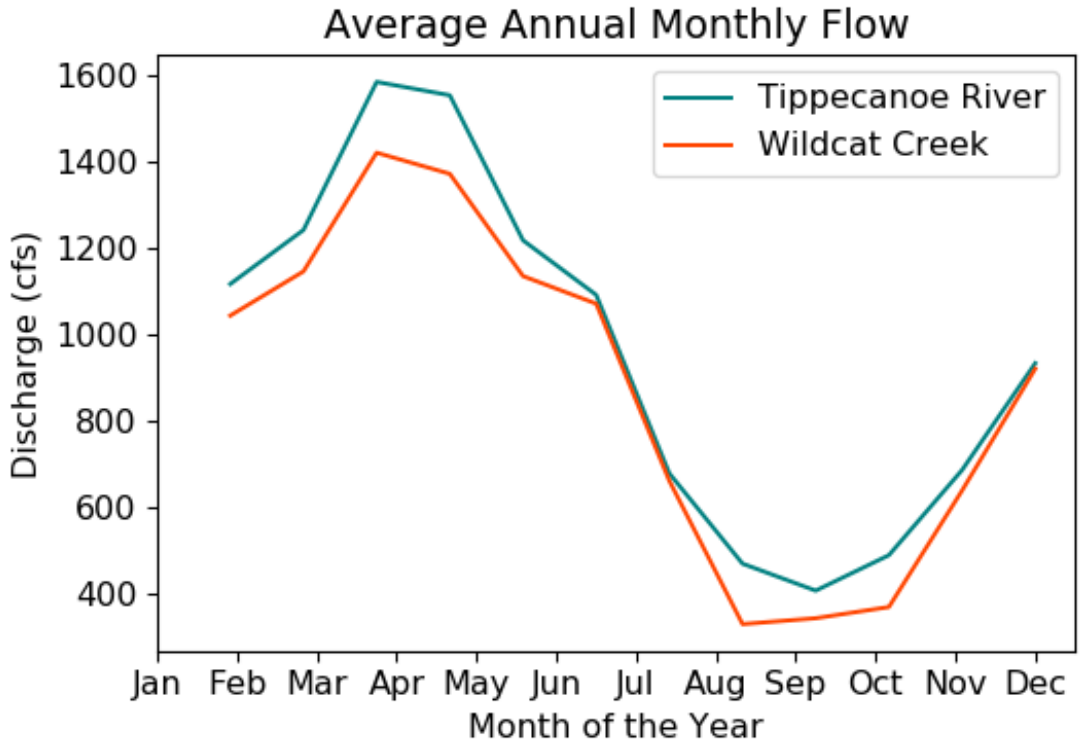
Annual mean Richards-Baker Flashiness (R-B) Index for the two stream gauges.

R-B index is sum of the absolute values of day-to-day changes in daily discharge volumes/total discharge volumes for each year.



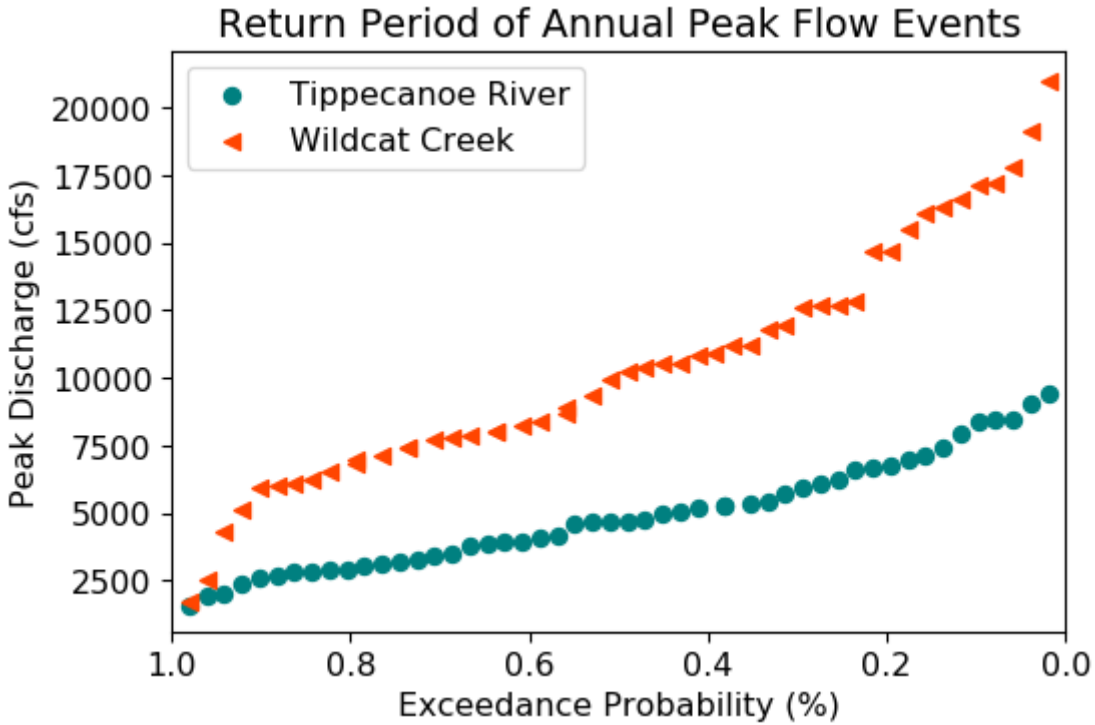
Comparisons are done for the period 1969 - 2019

Monthly averaged mean discharge (cfs) for the two stream gauges.



Comparisons are done for the period 1969 - 2019

Return period of Annual Peak Flow Event for the two stream gauges



plotting position (or exceedance probability) for each event is calculated using the Weibull plotting position equation:

$$P(x) = \frac{m(x)}{N+1}$$

where m = rank of precipitation event x, and N = number of observations.

In conclusion

- The two watersheds drain very similar areas that are very close together
- There is no significant difference in climate, and both watersheds have similar land use (dominated by agricultural use).
- Still their hydrologic response, measured as streamflow, is not similar which is highlighted in the metrics presented here.