

Computer Exercise: Baseflow Separation

In this exercise, we will use the recursive digital filter of Nathan & McMahon (1990) to separate a quick flow component from stream discharge. The digital filter is programmed in Microsoft Excel for easy data manipulation.

An example data set from a mountainous watershed of Marmot Creek in Alberta (see next slide) is used for demonstration.

- (1) Open `BF_digit_filter.xlsx` file, and copy and paste the Marmot Creek 2009 data from the data file.
- (2) The chart on the spreadsheet shows total flow and baseflows separated by three different values of β . Examine the quality of separation and select an appropriate value of β .
- (3) Calculate the seasonal total flow and total baseflow (for the selected β), and compute the baseflow index (BFI).
- (4) Repeat (1)-(3) for 2010 and 2011, and compare the results.

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Marmot Creek watershed (9.1 km²), Alberta, Canada

- Elevation 1700-2700 m, the eastern edge of the Rocky Mountains.
- Mean annual precipitation = 640 mm at the base.

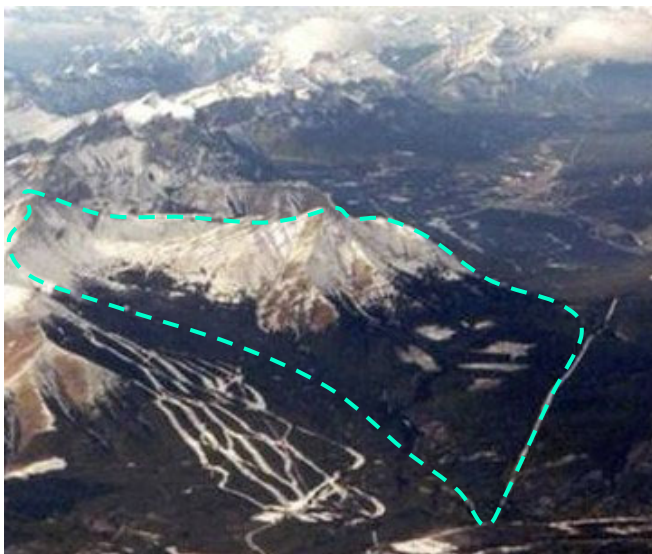
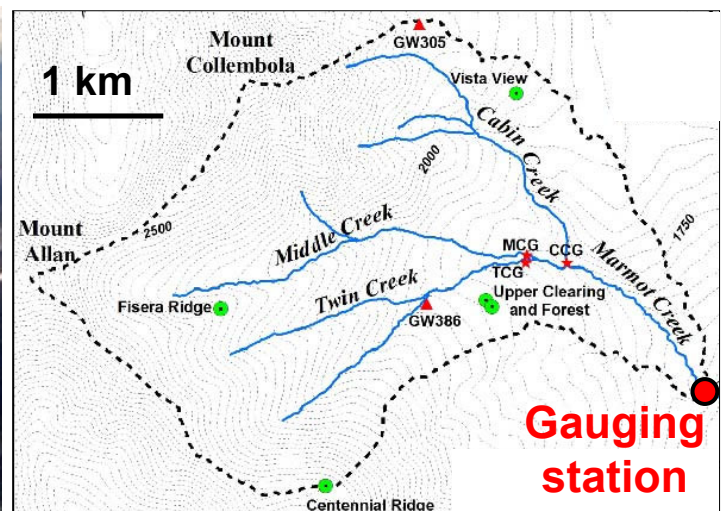


Photo provided by John Pomeroy



Fang et al. (2013. *Hydrol. Earth System Sci.* 17: 1635)

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