Streamflow and water quality monitoring
West slope of Mt. Mansfield

1999 Annual Report

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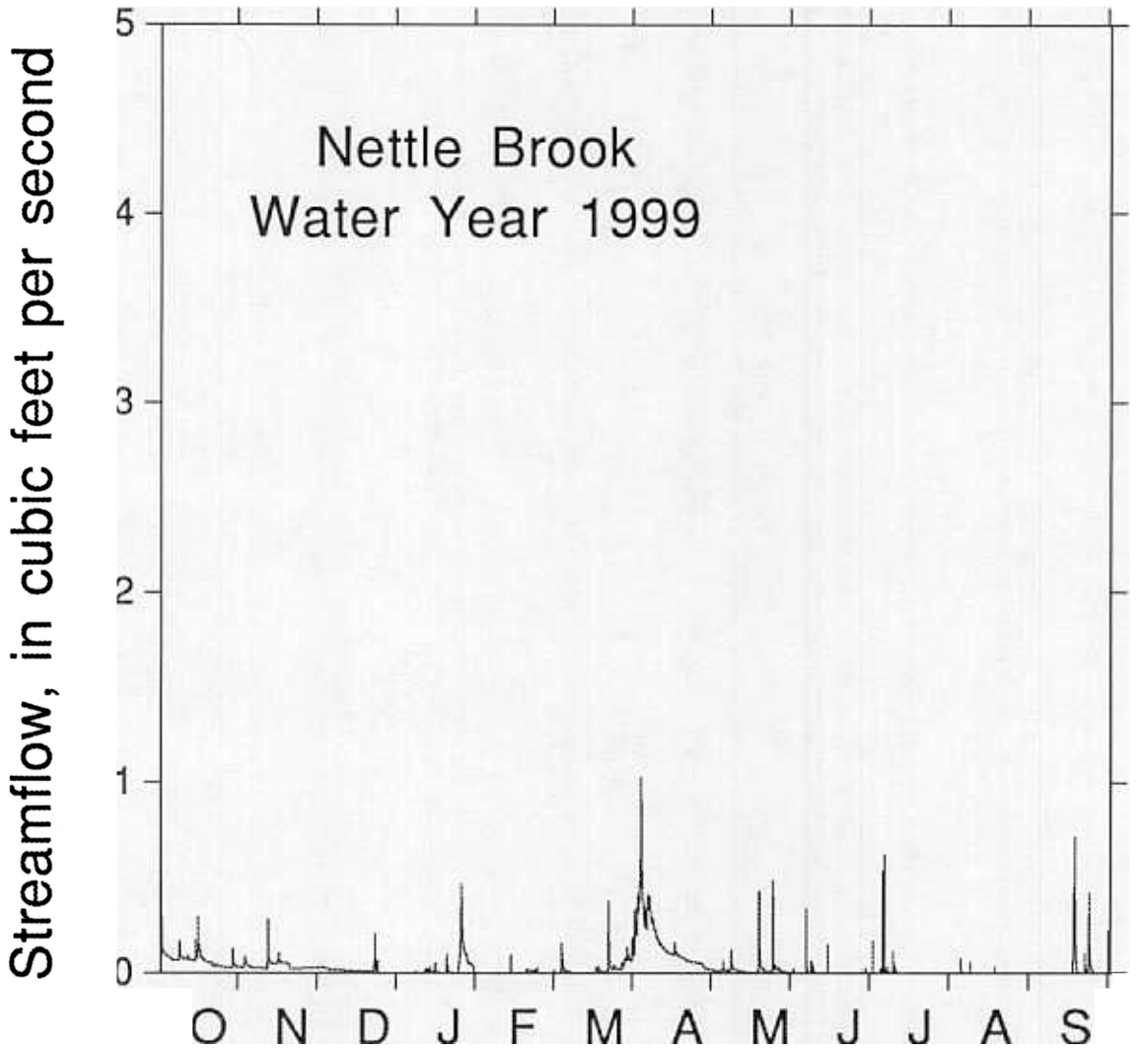
The USGS, in collaboration with the VMC, established a stream gage at Nettle Brook on the west slope of Mt. Mansfield in September 1993. A 90-degree V-notch weir was installed in the stream channel. Water levels are tracked by a float in a stilling well in hydraulic contact with the pool behind the weir. The rise and fall of the float drives a potentiometer which electronically records the pool level at 5-min intervals. Pool level is converted to discharge by a theoretical equation which has been validated by volumetric measurements. Streamflow data are collected continuously by datalogger and archived after each monthly site visit.

The 11-hectare catchment has been used for water quality studies, including nitrogen cycling and mercury biogeochemistry. Data quality is generally very good, but editing for the inevitable occurrences of backwater from ice and vegetative debris is performed on an "as needed" basis by standard USGS techniques.

The 1999 water year (October 1998 through September 1999) was a near-average year in northern Vermont. Conditions at Nettle Brook, however, appeared to be drier than average. The peak flow for the year was just 1.0 cubic feet per second (cfs), occurring in early April during snowmelt. Typical annual peaks are in the 3 to 5 cfs range. There were no notable peak flows during the fall and winter periods. Despite a snowpack that was near average in water equivalent, the snowmelt flow peak and flow volume were well below average because very little rain fell during the melt period. This lack of rainfall continued into the summer months, leading to drought conditions in much of Vermont. The drought spell began to be broken with the arrival of Hurricane Floyd on September 16. The Hurricane had a surprisingly small effect on Nettle Brook, compared to other northern Vermont streams. It appears that much less rain fell in the western part of the state, and perhaps there was rainfall shadowing of west-facing slopes. For comparison, Lewis Creek in the Champlain Valley peaked at about 1/3 of the flow per unit area as streams in central and eastern Vermont such as the Dog River and Sleepers River. Nettle Brook had a similar flow per unit area as Lewis Creek.

Some editing of the streamflow data was performed in water year 1999 in conjunction with some Hg research by Krista Rinehart at the University of Vermont. In general, the data appear to be largely free of major artifacts from ice and debris.


Streamflow, in cubic feet per second
Nettle Brook
Water Year 1999
5
4
3
2
1
0
O
N
D
J
F
M
A
M
J
J
A
S