

Streamflow and water quality monitoring West slope of Mt. Mansfield

1997 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 1997 water year (October 1996 through September 1997) was slightly wetter than average in northern Vermont. Some heavy fall rain events culminated in a very wet December. The winter was quiet, lacking the large January thaws of the 2 prior years. A minor thaw in late February preceded a slow, prolonged snowmelt period. The melt started in late March as usual but extended well into May as a series of late season storms brought varying mixtures of snow and rain to the mountains and temperatures remained well below average. The summer was perhaps on the dry side of average, with no notable high-flow events.

The record is excellent from 1 April through the end of the water year as it was edited in support of some ongoing mercury work by Andrea Donlon. Approximately 30 samples of streamwater under various flow conditions were analyzed for Hg. In addition, Andrea collected soil water from shallow and deep points in the unsaturated zone for Hg analysis. The results confirmed earlier findings that Hg transport in streamwater tends to occur predominately at high flow. The new insight from Andrea's soil water monitoring is that Hg movement toward the stream occurs primarily in the shallow organic-rich soil in association with dissolved organic carbon.

Streamflow in cubic feet per second

Nettle Brook
Water Year 1997

