Trout Out of the Classroom and Quality Control

Sophia Samantaroy, Elsa Wilbur, and Kirk Smith

2019 Outings

<u>March 31st</u>
Wildcat Hollow
(Fauquier County)

Edinburg Gap Run
(Shenandoah County)

<u>April 6th</u>
Mountain Run at
Moreland Gap
(Shenandoah County)

Tasker's Gap
(Shenandoah County)

We send our data to the VDGIF and the Izaak Walton League, so it's crucial to get it done properly!

Typical Procedure for 2019

As a part of every data collection outing, TOC measured the rate of flow of the stream at three different points with a flow meter. The procedure was as follows:

-measure width of the stream

-divide stream into 6 increments

-measure depth at each increment

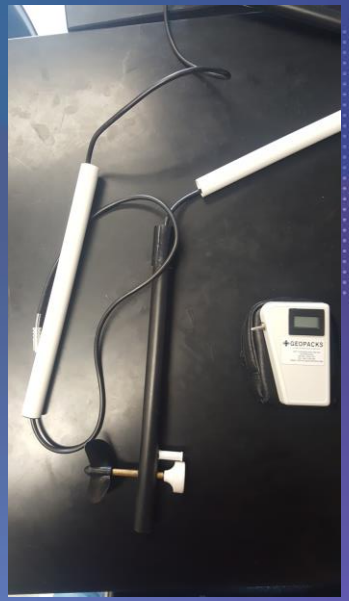
-measure flow with meter at each increment

Calculations

distance (m)	meter counts	depth (m)	Flow velocity (m/s)			1st Central Site (South River, Stanardsville, VA)				
0.73	86	0.15	0.123444			23-Apr-16				
1.46	50	0.3	0.0927			flow taken at 0.4 of depth and not 0.6 due to numerous boulders				
2.19	284	0.31	0.292536							
2.92	399	0.2	0.390746			Central Site was 3.0 meters wide; rectangular shape				
3.65	176	0.3	0.200304							
		0.252								
		0.756	0.219946	0.55188	m^3/s		0.166279			
							0.223059			
Flow rate =	0.19 m^3/s						0.194669	average of site #1 and site #2		

Causes of Error

- Flow meter doesn’t work with low flow
- Deviations from the manual



Calculations

In order to calculate flow rate and discharge, we needed to hand calculate using the raw data because the data we collected was not compatible with the pre-existing spreadsheet that calculated for us.

How The Math Works

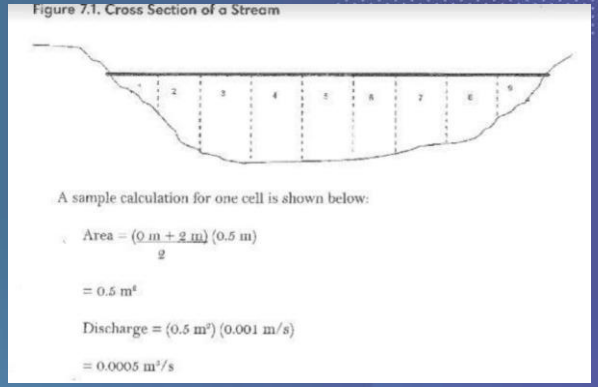


Figure 7.1. Cross Section of a Stream

A sample calculation for one cell is shown below:

$$\text{Area} = \frac{(0\text{ m} + 2\text{ m})}{2}(0.5\text{ m})$$

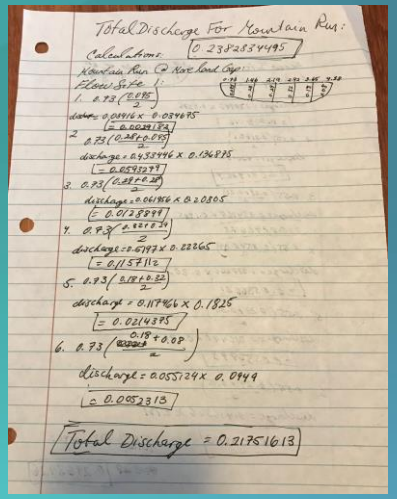
$$= 0.5\text{ m}^2$$

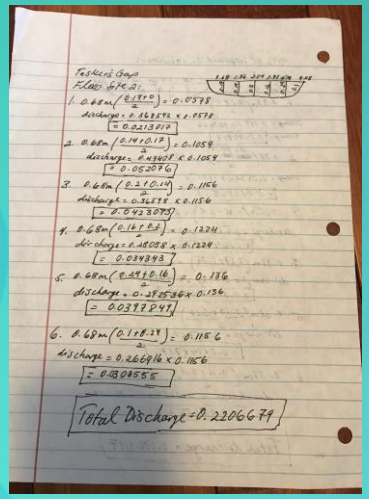
$$\text{Discharge} = (0.5\text{ m}^2)(0.001\text{ m/s})$$

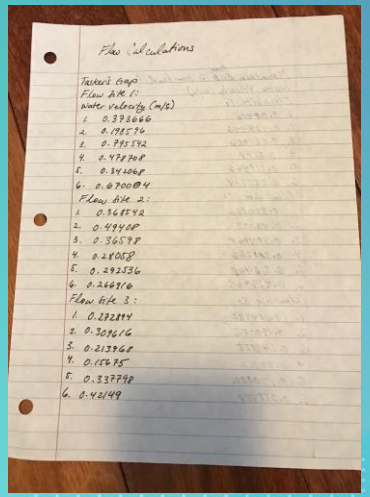
$$= 0.0005\text{ m}^3/\text{s}$$

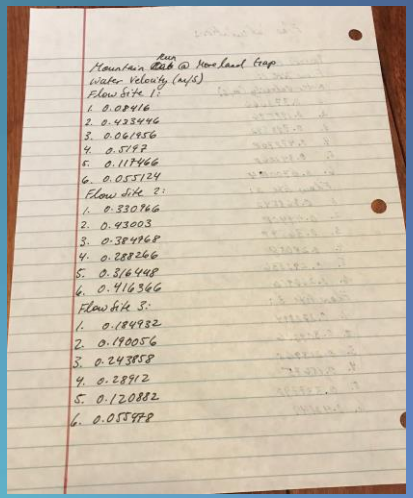
1. Divide the stream into cells
2. Calculate area of an interval with the formula: ((Side+Side)(width))/2
1. Discharge of cell is calculated as: Discharge=(area)(flow rate)
1. To find total discharge, add all of the cells together.

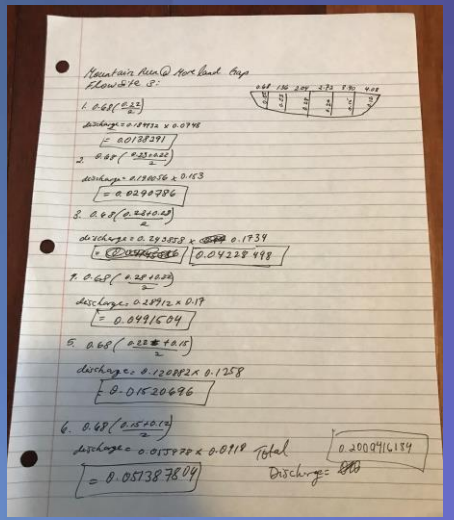
Sophia's Calculations











What We Learned

Acknowledgements

Thanks to the JMHS Administration for their support.
Special thanks to members of the TIA alliance—Trout Unlimited, the Izaak Walton League, and the American Fisheries Society.