Eutrophication can occur in waterways due to N runoff from agriculture and industry sources. Removing N from the stream after it already entered is the strategy highlighted. ISCO automatic grab water samplers are used to collect samples up and down stream. A flow meter is placed in the stream to collect changing water depths. The difference in the levels from upstream from downstream will show the stream’s natural ability to remove the extra nitrogen. Plant mass could remove 40-70% of nitrogen depending on aquatic plant life and flow rates. The targeted stream will later go through a restoration process and post-restoration monitoring.

This graph shows the bank used for this stream in Manning’s equation.

MANNING'S EQUATION

\[
Q = vA = \left(\frac{1.49}{n}\right)A^{5/3}\sqrt{S_f}
\]

- \(n\) = n-coefficient
- \(A\) = cross-sectional area
- \(S_f\) = friction/bed slope
- \(P\) = wetted perimeter

Manning’s equation found the volume of water flowing through the stream over an amount of time. n-coefficient was found on the storm water manual for Lexington-Fayette County to be 0.045 for streams in this area. \(S_f\) was estimated due to the flat area surrounding the stream to be 0.008 ft./ft. The load of total N for ISCO A was ~190kg and for ISCO B it was ~206kg over a two week period. The upstream samples often had a higher nitrogen flux compared to the downstream samples, showing that the stream has a natural ability to remove nitrogen. The load was calculated using Riemann sum estimation. The source of nitrogen pollution was caused by nitrate and nitrite as opposed to ammonia.

The load was calculated using Riemann sum estimation.

The percent removed was calculated to be 7.97% from ISCO B to ISCO A. The percent removed was significantly lower than the 40-70% ideal removal. The percent removed was significantly lower than the 40-70% ideal removal. The percent removed was significantly lower than the 40-70% ideal removal. The percent removed was significantly lower than the 40-70% ideal removal. This low percentage could be caused by high flow rates, low biomass, and/or nitrogen rich soil. The current construction next to the alumni creek site could also attribute to the low percentage. The nitrogen amounts in the stream are too high for the stream to naturally remove and is in need of restoration.

The nitrogen concentrations of the 10 mL samples were determined using SEAL analysis.

Ammonia occasionally was found in the stream nitrogen content.

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References: