

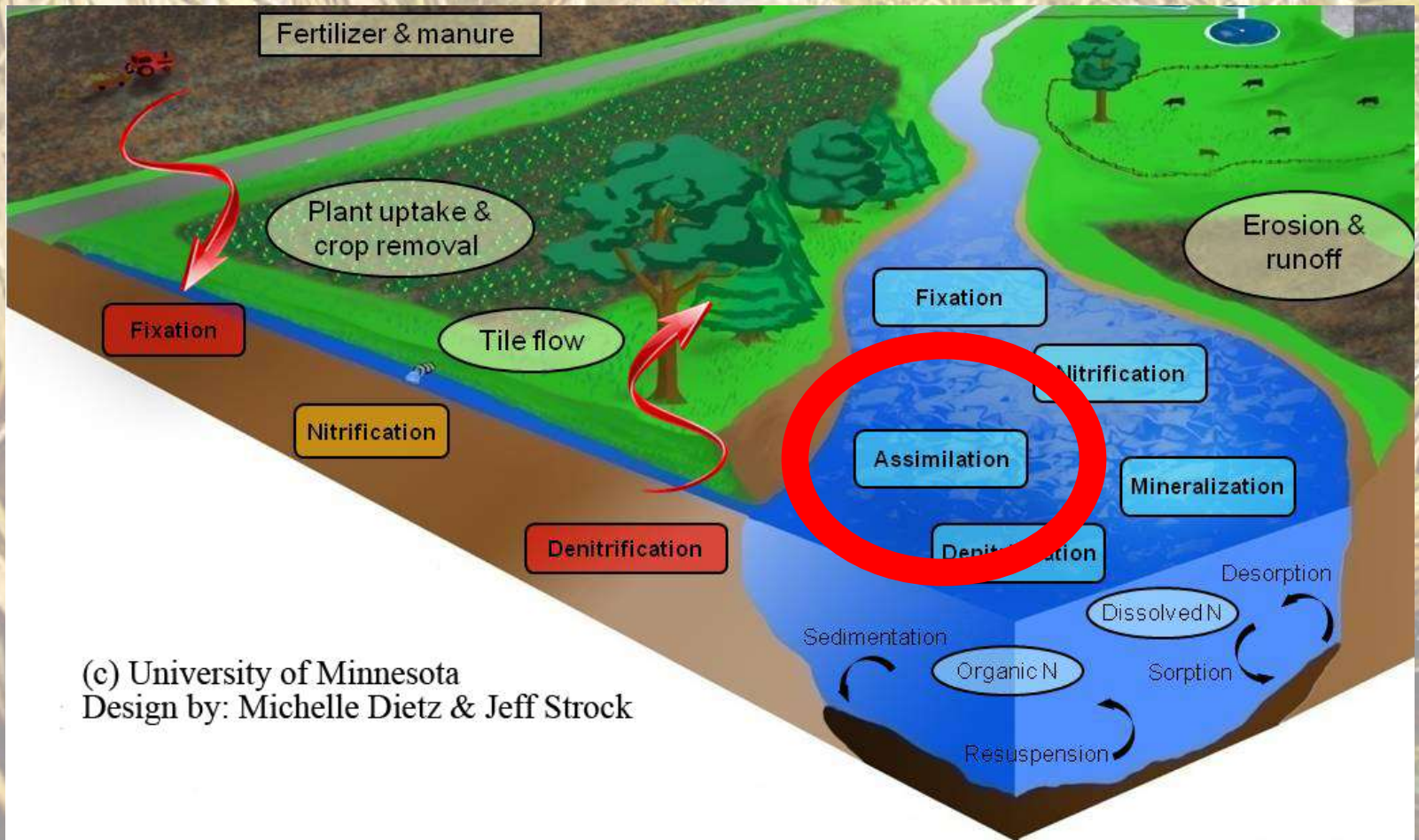
A photograph of a small mountain stream flowing through a dense thicket of tall, golden-brown reeds. The water is clear and reflects the surrounding vegetation. The reeds are tall and thin, with long, narrow leaves. The stream is narrow and appears to be in a mountainous area.

NITROGEN CYCLING IN A SMALL OPEN-CANOPY MOUNTAIN STREAM

Paige Hellbaum
with Erin Hotchkiss and Bob Hall

Nitrogen in Rivers





(c) University of Minnesota
 Design by: Michelle Dietz & Jeff Strock

Tracer Studies

- ^{15}N is a stable isotope – less common than ^{14}N
- Allows us to label and track N

- $$\delta^{15}\text{N} (\text{‰}) = \left[\frac{R_{\text{samp}}}{R_{\text{std}}} - 1 \right] * 1000$$

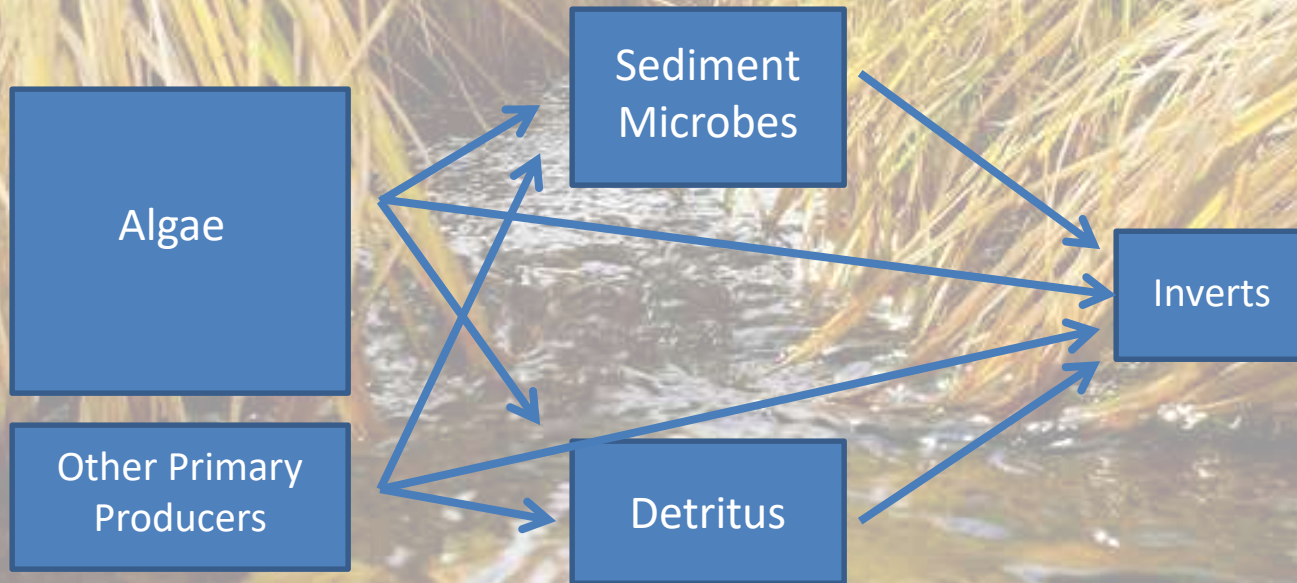
** $R_{\text{std}} = ^{15}\text{N}/^{14}\text{N}$ of N_2 in the atmosphere

Question 1: What is biological Nitrogen demand?



Question 2:

What is the fate of Nitrogen over time?



Little North Fork of French Creek

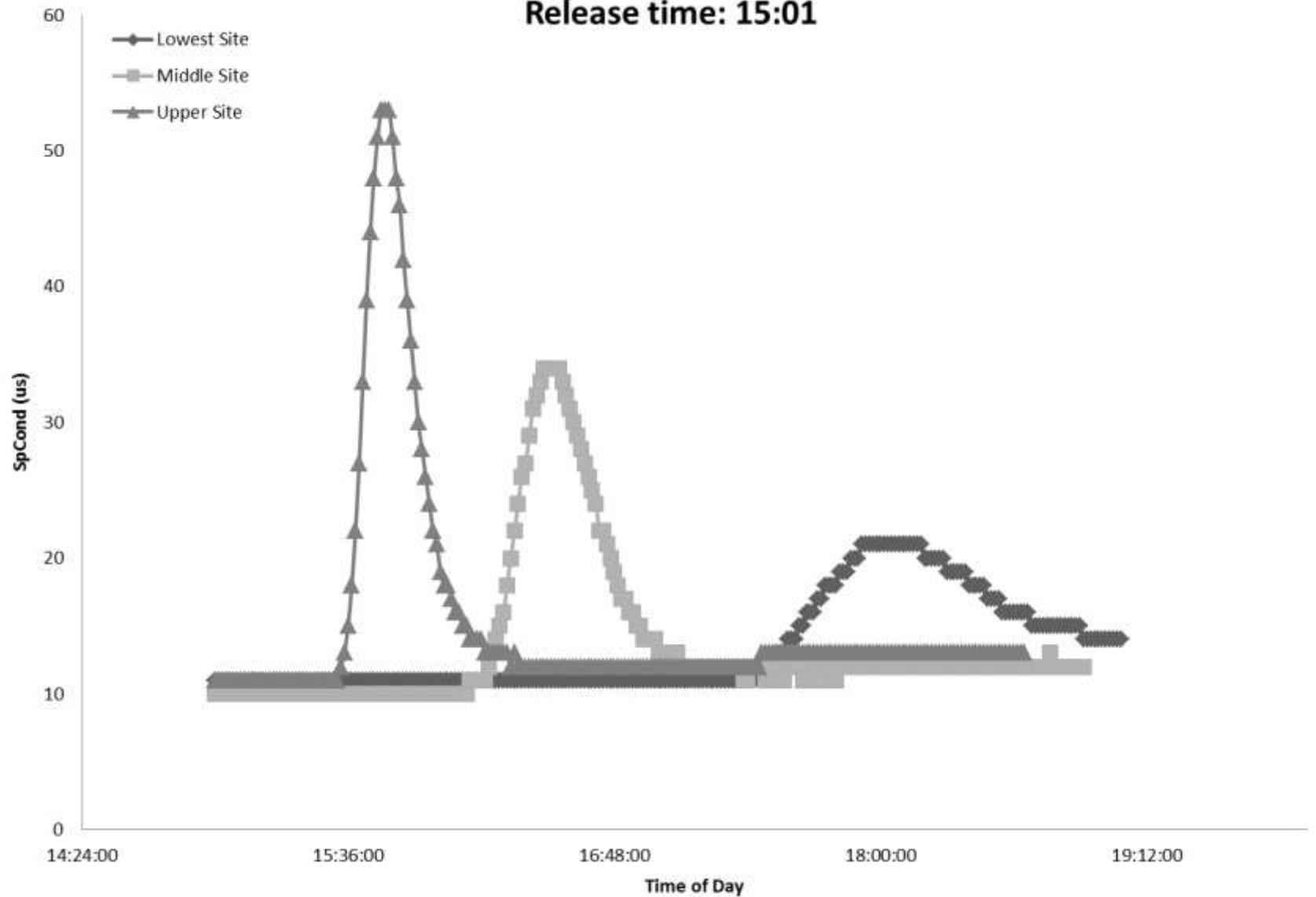



Study Site Characteristics

- Length: 711 m
- Average
 - Width: 1.37 m
 - Depth: 0.155 m
 - Average Discharge: 0.014 m³/sec
- 9 Sampling Stations
- Two distinct reaches separated by highway

NaCl Pulse Addition - North French Creek - 22 Aug 2012

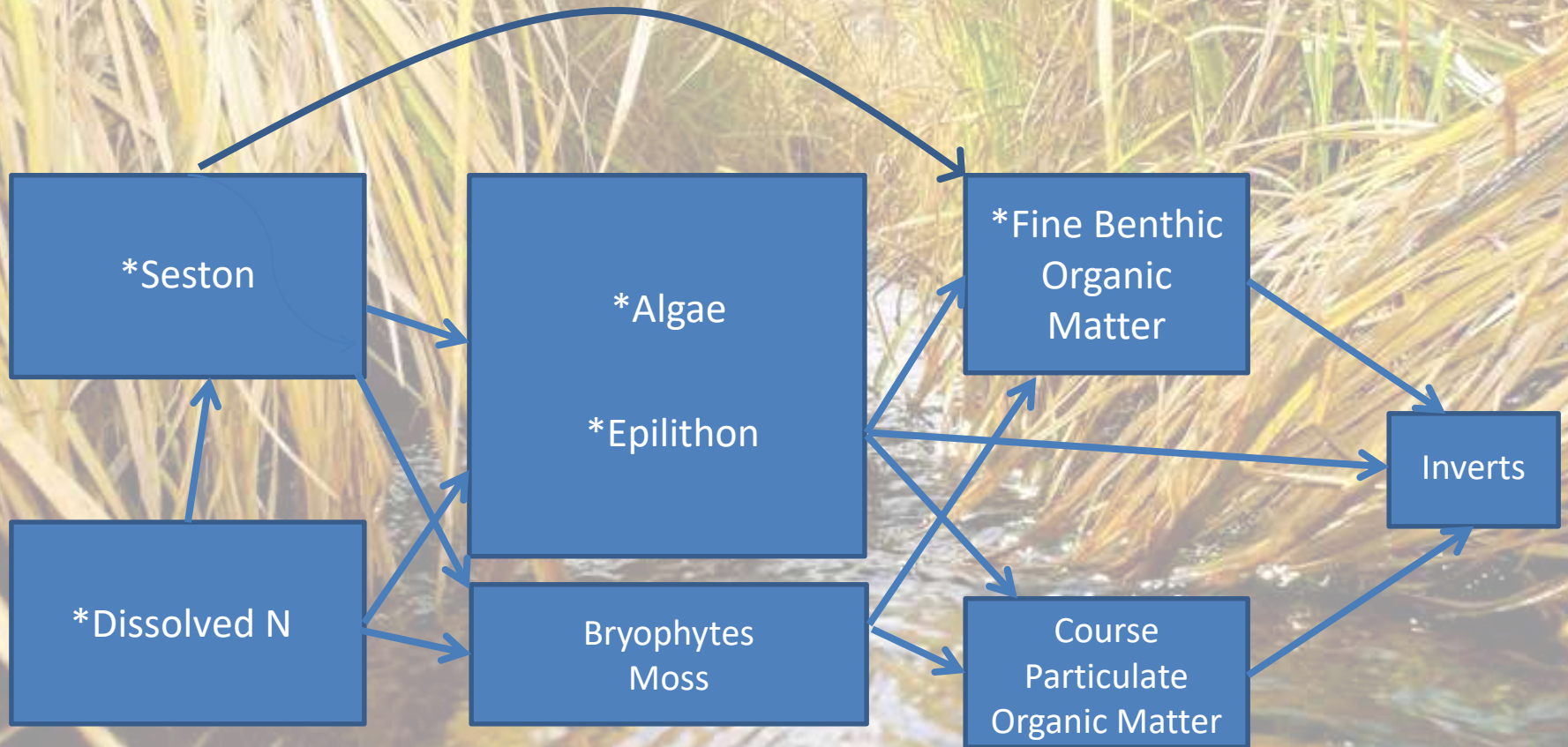
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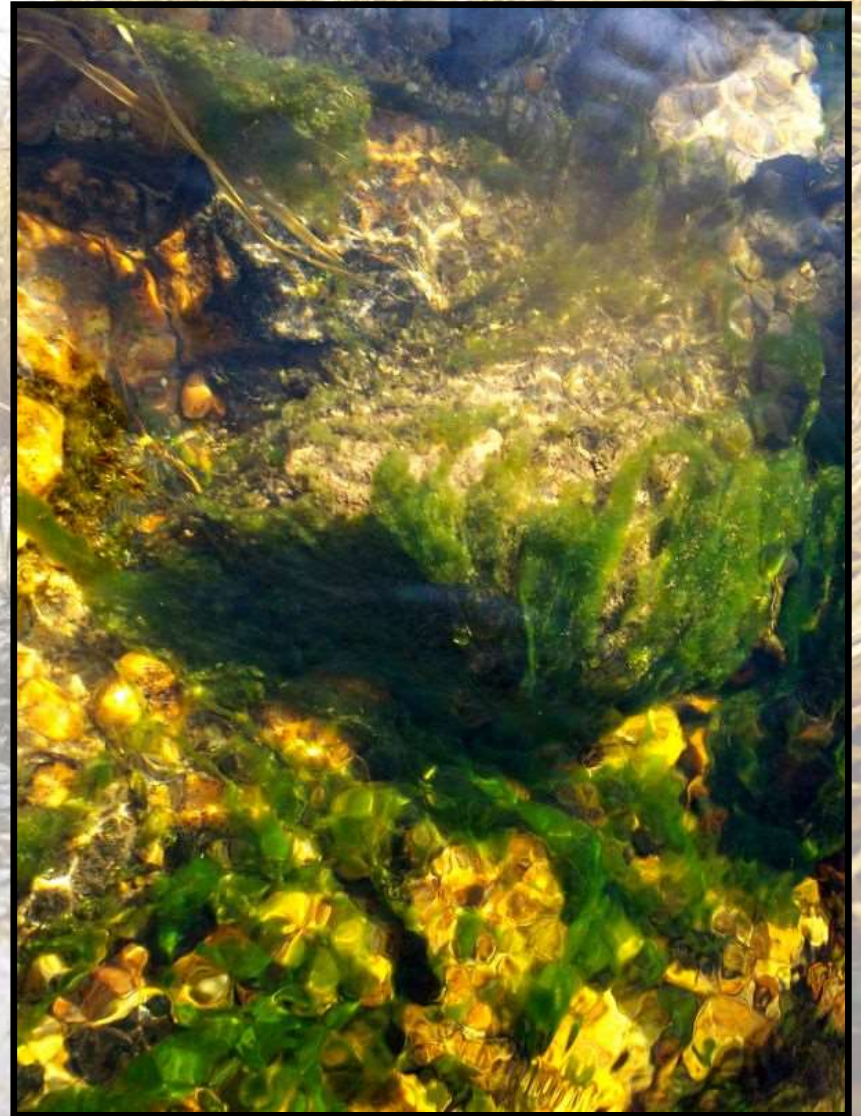
A photograph of a stream in a forest. The stream flows from the background towards the foreground, surrounded by lush green vegetation and tall evergreen trees. On the right bank, there is scientific equipment including a white container, a green box, and a white tube. A white and red striped marker is visible in the foreground on the right. The sky is blue with some clouds.

K ¹⁵NO₃ drip line addition at site 0
NaCl pulse as a conservative tracer

Field Methods



* Indicates greatest level of expected enrichment – based on previous studies



Lab Methods

- Hess Net Samples and invertebrate processing
- Preparing samples to be analyzed by WYSIF



Future Data Analysis

- Further invertebrate processing
 - Isotopes = where N is found in invertebrates
 - Hess Net = how many invertebrates are there?
- Data analysis of isotope results
 - Which organisms sequestered the most ^{15}N ?
 - Is N in high demand?

Acknowledgements

Big thank-you to both my mentors (Erin Hotchkiss & Bob Hall)

My coworker Jessica Neuwerth

