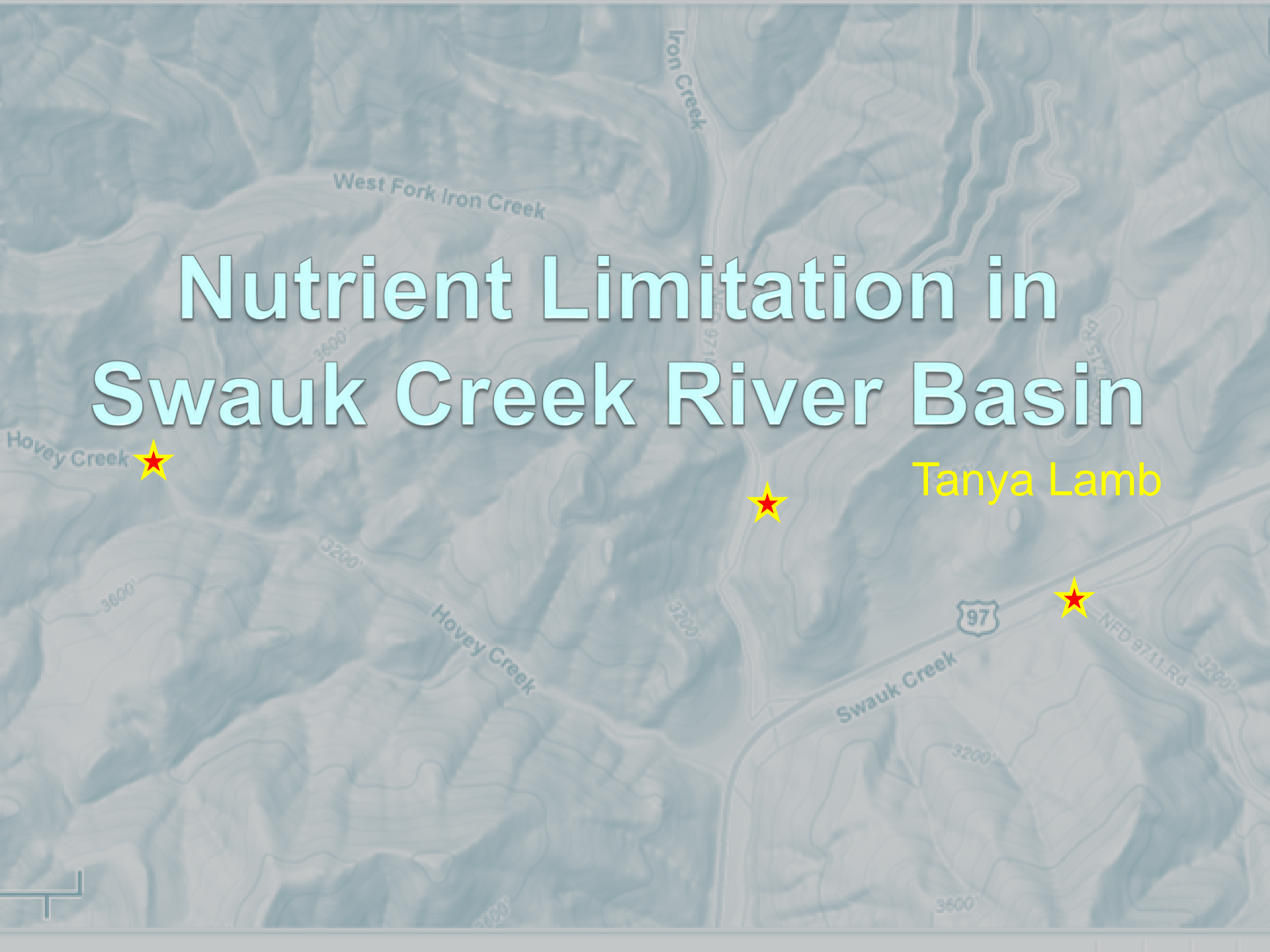


Nutrient Limitation in Swauk Creek River Basin

Tanya Lamb



Purpose

- Identify if Creeks are nutrient limited
- If limited, identify the limiting nutrients
- Changing nutrient limitation patterns
 - Summer vs. Fall
- Management implications for salmon restoration

Previous research knowledge

- Nutrient concentrations control stream food web productivity
 - Nitrogen
 - Phosphorus
- Primary production = organic matter produced
 - Photosynthesis by autotrophs (algae and plants)
- Respiration = total consumption of organic matter
 - Autotrophs and heterotrophs (bacteria and fungi)



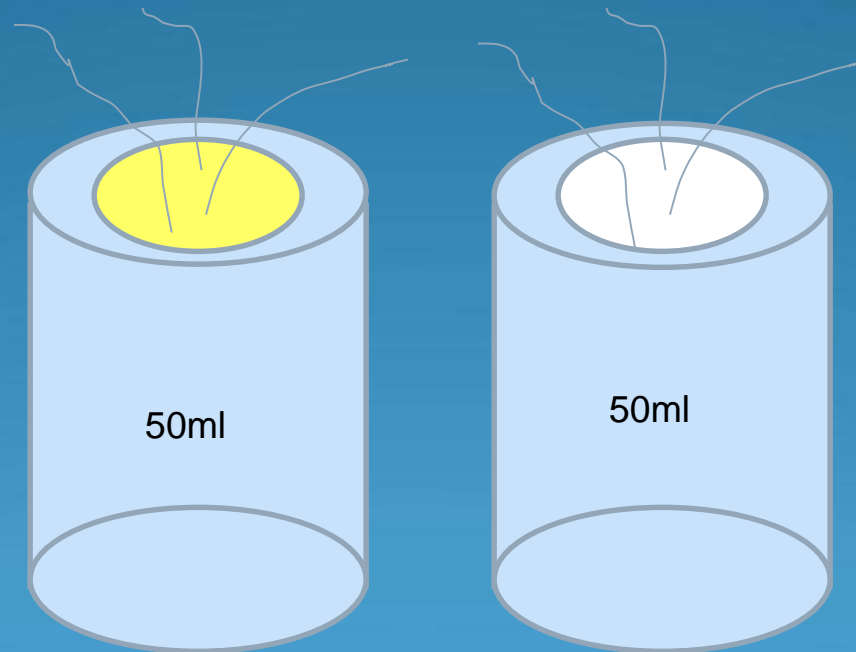
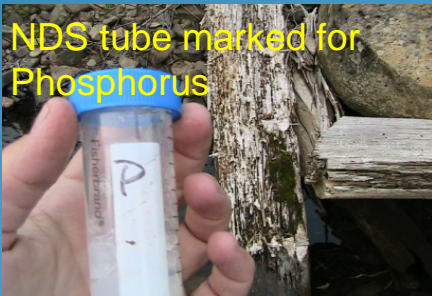
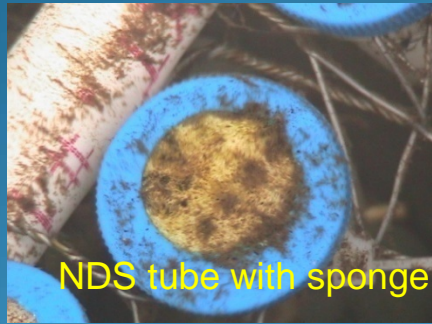
A WASHINGTON LOGGING SCENE.



Goals and Objectives

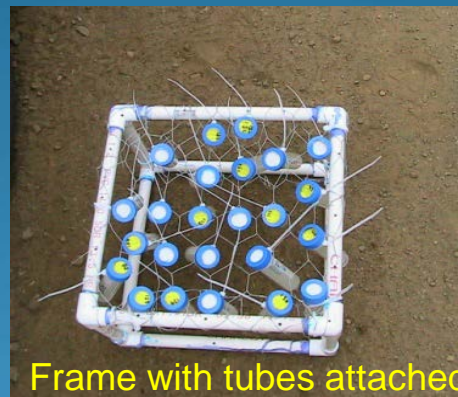
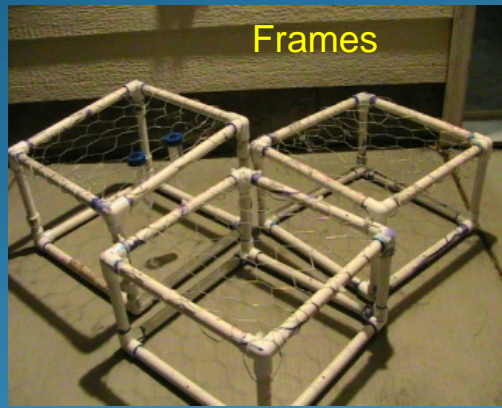
- Determine whether Nitrogen and/or Phosphorus limits autotrophic and/or heterotrophic biofilms
- Compare nutrient limitation status among streams to determine the relative importance of regional and local influence

Design and Data collection



Sponge = heterotrophs Glass = autotrophs

Design and Data collection



Study Area



Iron Creek in the Summer



Swauk Creek in the Fall



Hovey Creek in the Fall

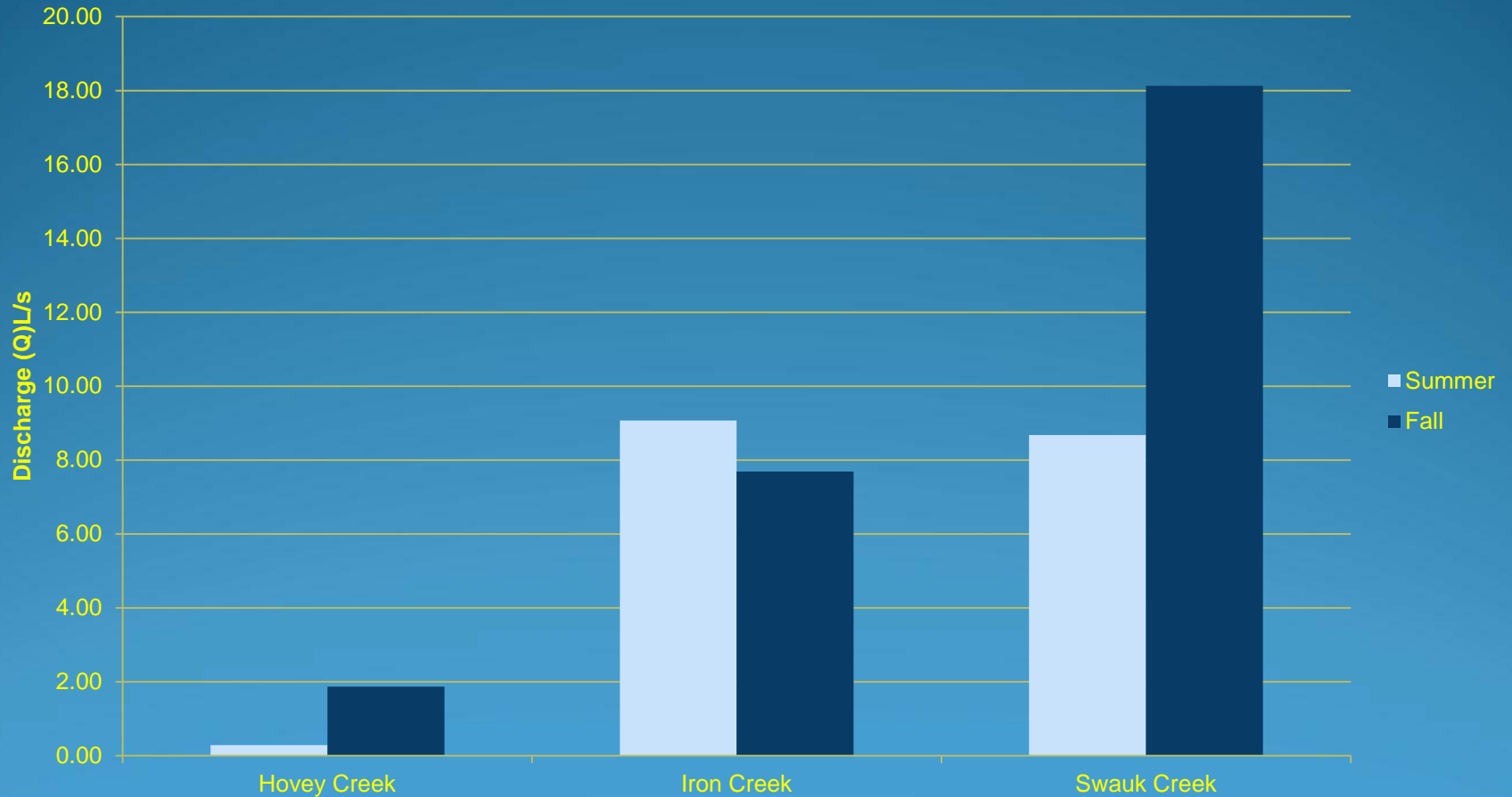


Iron Creek in the Fall

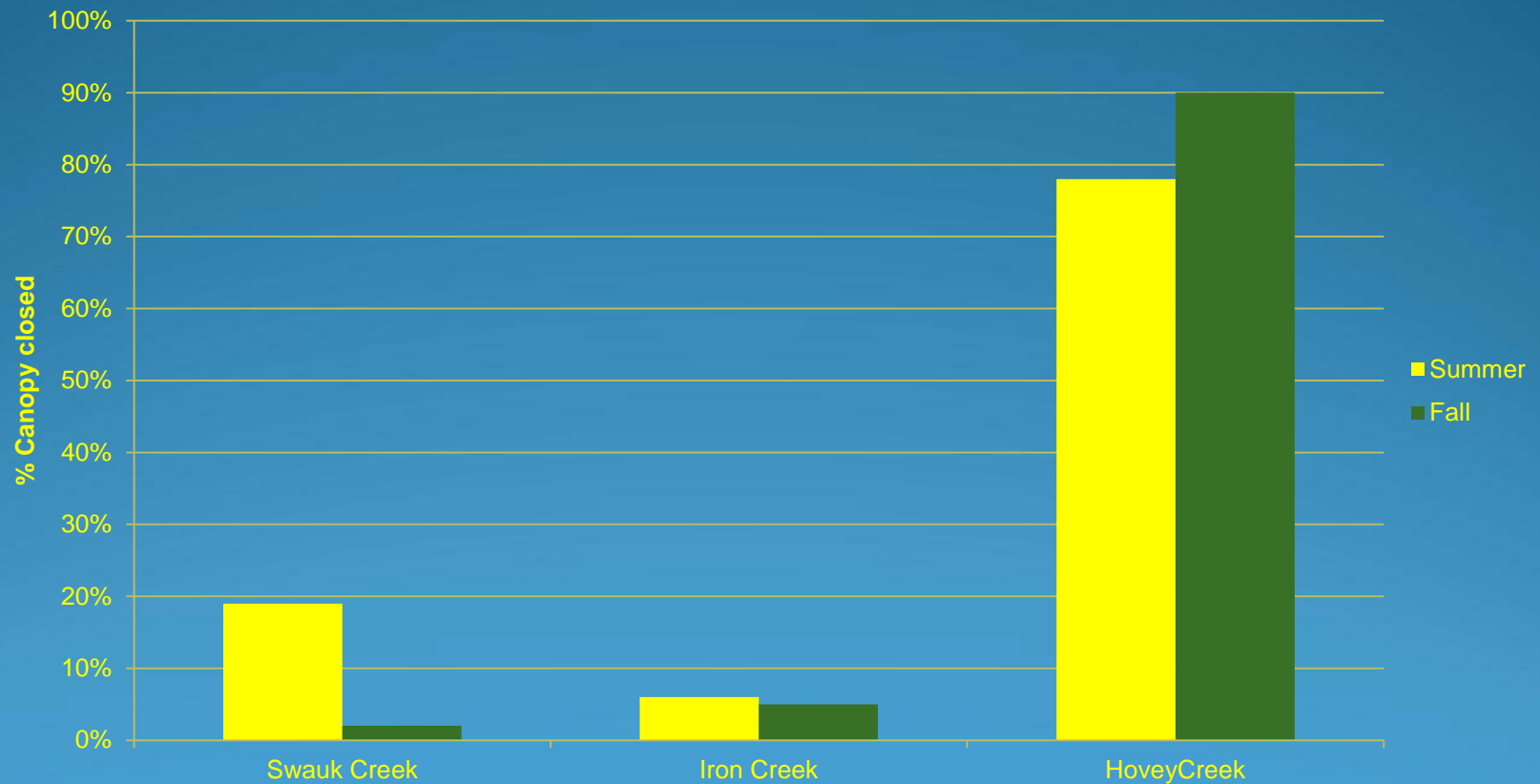
Characterize the Streams

- Discharge
- Canopy Coverage
- Leaf Litter
- Temperature
- Chemistry of the streams

Discharge

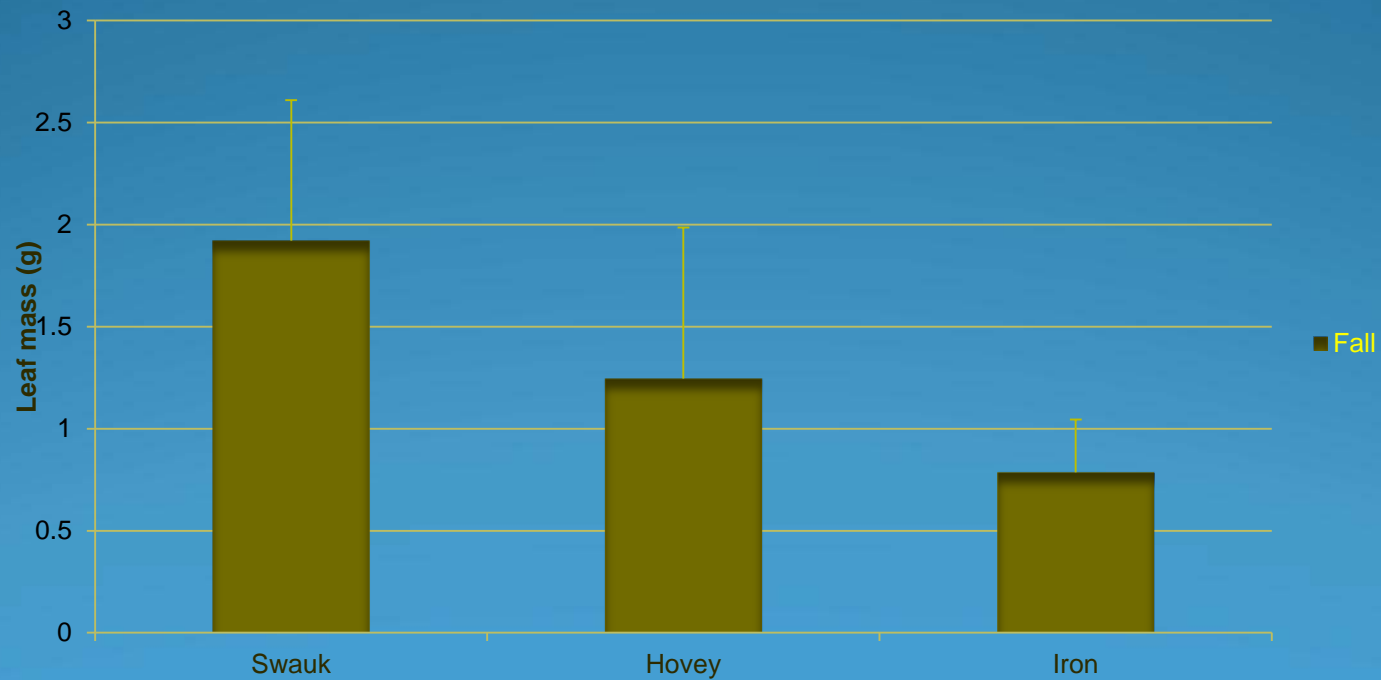


Canopy coverage

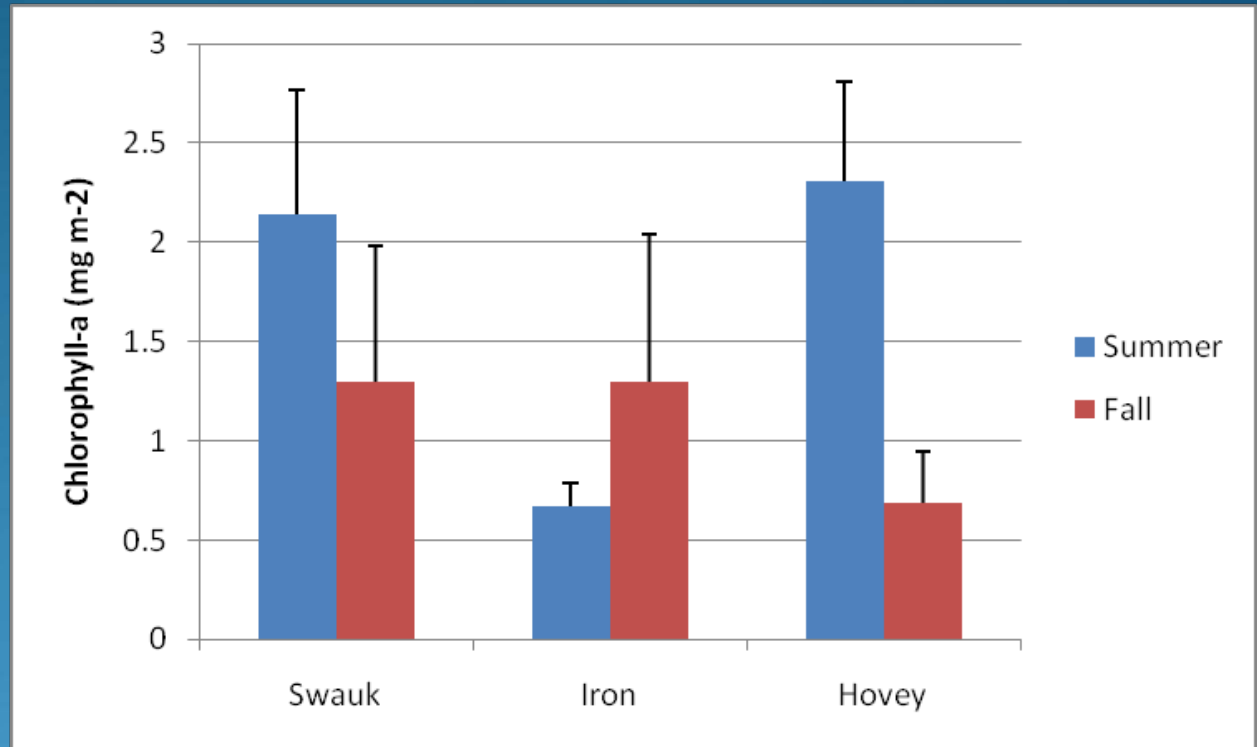


Leaf Litter

Average Leaf litter per stream



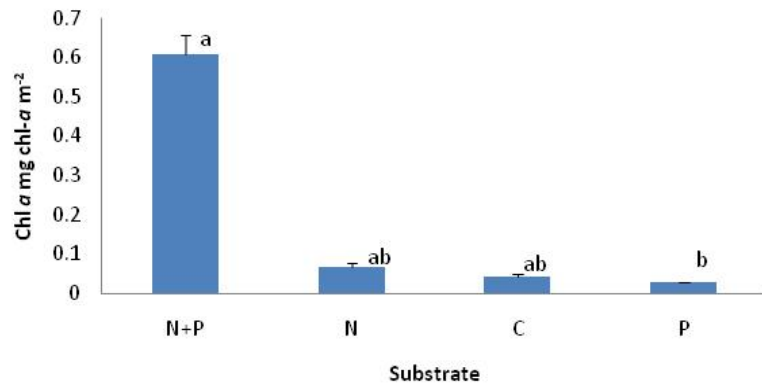
Results



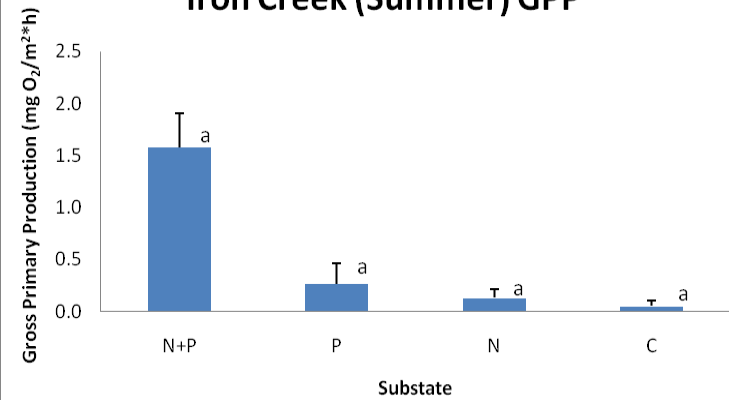
- Streams had more algal biomass in the summer compared to the fall (2-way ANOVA, $p=0.031$)

Iron Creek

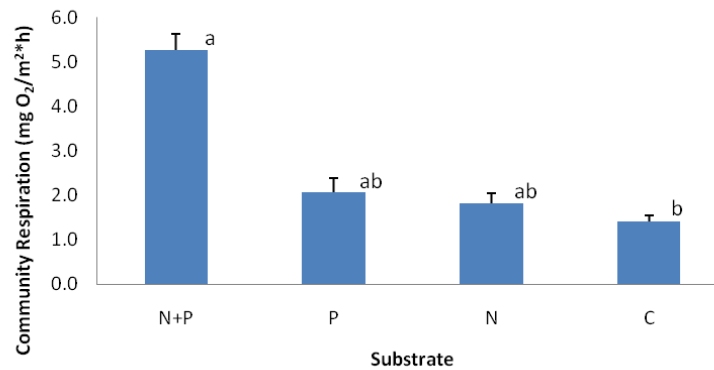
Iron Creek (Summer) Chl α



Iron Creek (Summer) GPP

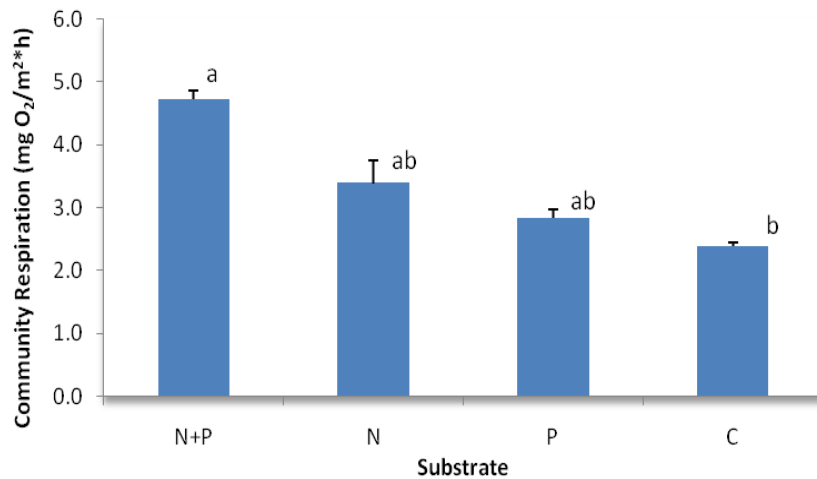


Iron Creek (Summer) CR

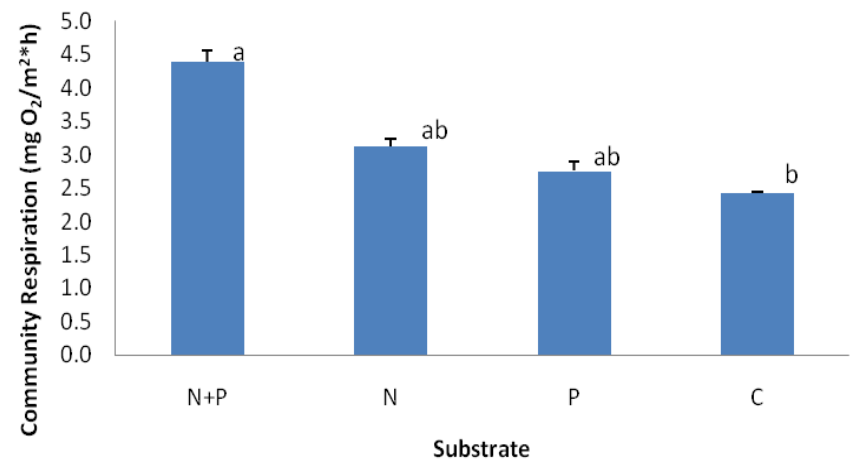


Hovey Creek

Hovey Creek (Fall) CR



Hovey Creek (Summer) CR



Conclusion

- Limitation is co-limited by nitrogen and phosphorous
- Influence the management of Swauk Creek Basin for salmon habitat restoration and improved watershed conditions
- Future sampling and testing needed
- Larger samples

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Questions?