

Microbial Diversity During the Polar Night Transition in Lakes of The McMurdo Dry Valleys

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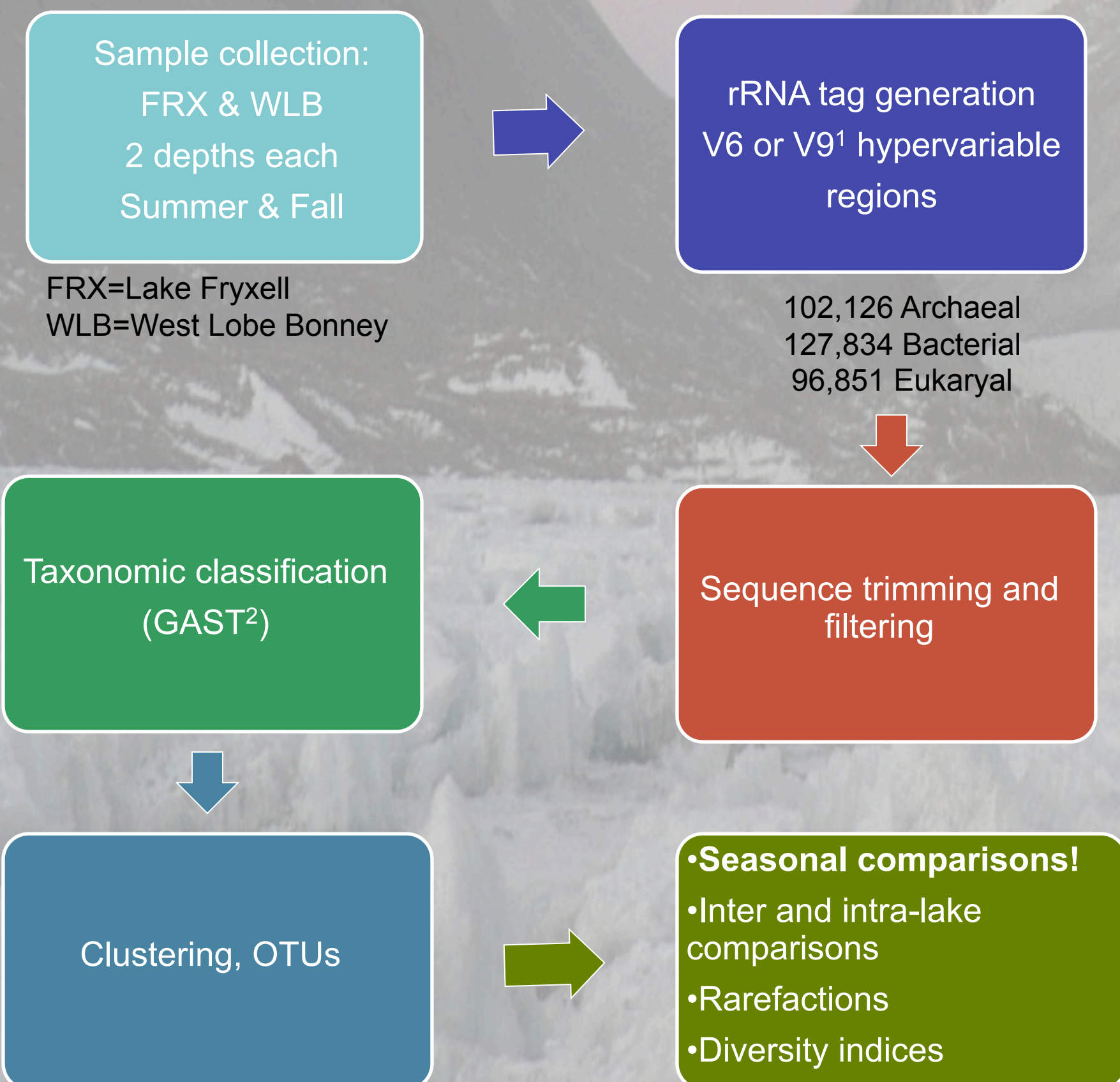
Conclusions: Tag sequence data showing Eukaryal community structures **cluster by season**, regardless of depth, in FRX. Samples **cluster by depth** in WLB. **Fluorescence** data show **upward migration** of phototrophs in the **fall** in FRX and **clustering by depth** in WLB.

Introduction: During the 2007-2008 IPY, we stayed in the MCM during the **summer-winter transition**. Sampling during the darkness of winter is logistically prohibitive; this study is an important step towards understanding the **year-round ecology** of MCM lakes. This project allowed us to examine ecosystem responses as **photosynthetic inputs of new carbon stopped**. We **hypothesize** that the change in season and loss of carbon inputs lead to changes across the lake ecosystems, which may manifest as **shifts in microbial community structures**.

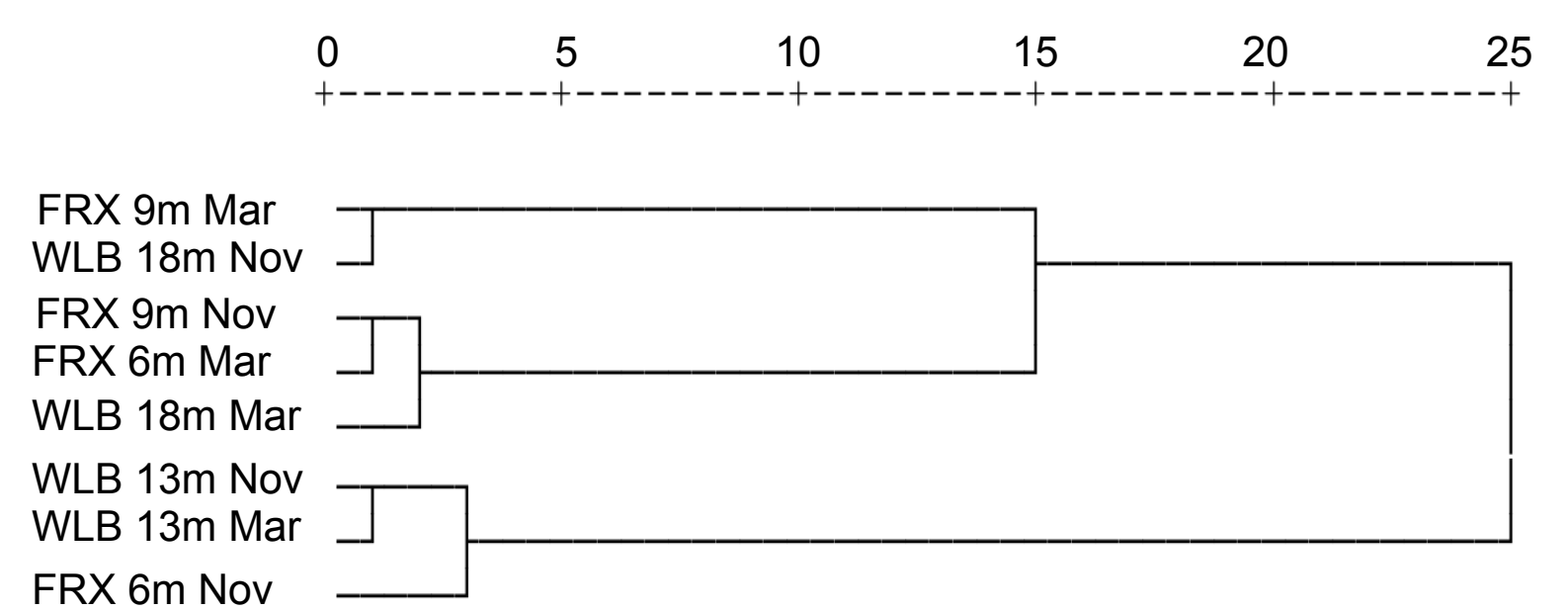


Methods:

- Underwater spectral fluorometer detection of phototrophic communities.
- 454 pyrosequencing identification of microbial communities.



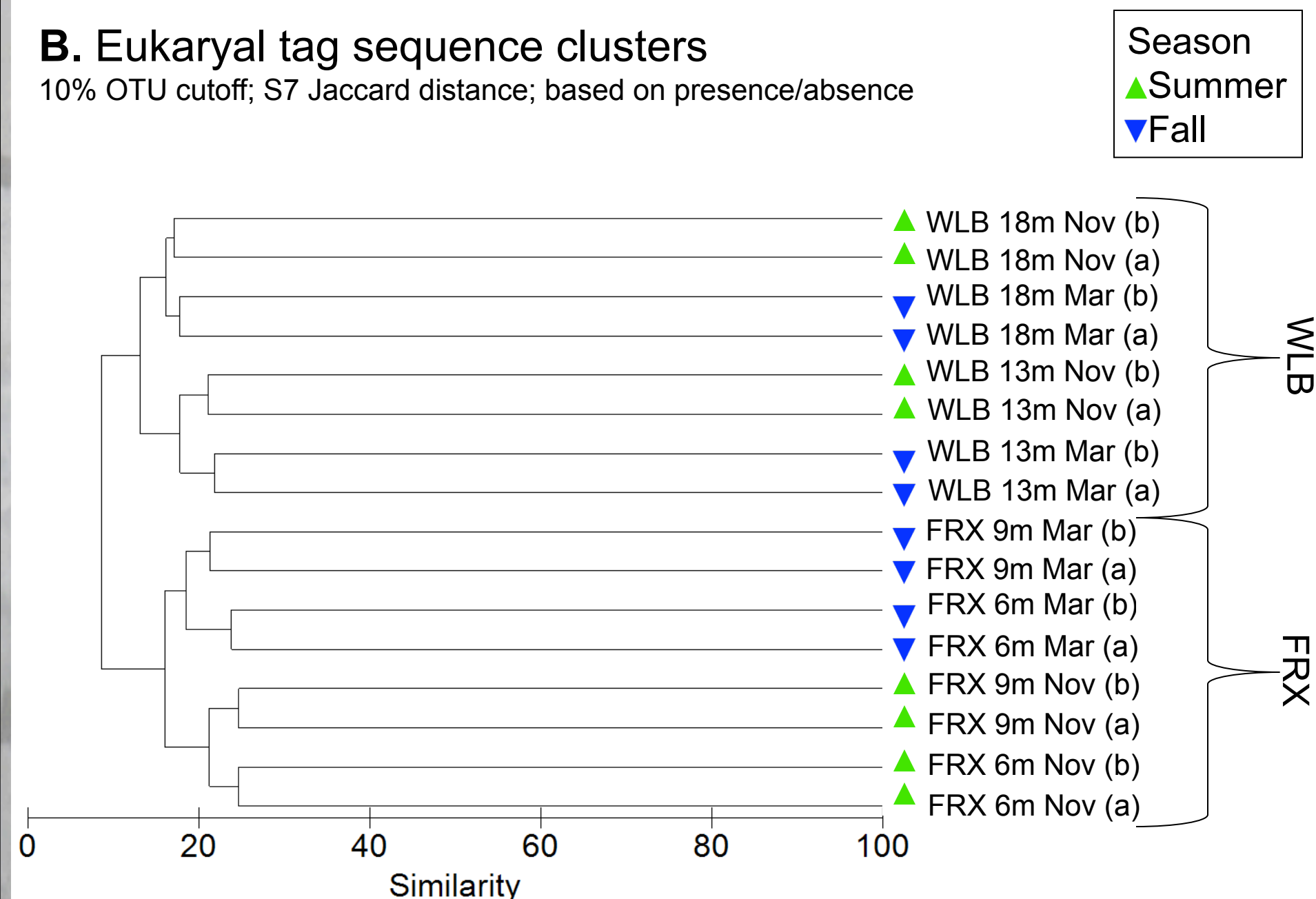
Results: Phototrophic community structures



A. Fluorescence-based clustering of phototrophic communities. Furthest neighbor linkage, Pearson correlation interval.

B. Eukaryal tag sequence clusters

10% OTU cutoff; S7 Jaccard distance; based on presence/absence



¹Amaral-Zettler L.A., et al., *PLoS ONE* 4, (2009).

²Huse, S.M., et al., *PLoS Genetics* 4, (2008).

Significance: This study presents some of the first data on the responses of MCM lake microbial communities to the summer-winter transition. Because sampling cannot be conducted during the winter, these data are important in understanding the year-round ecology of dark, icy systems.