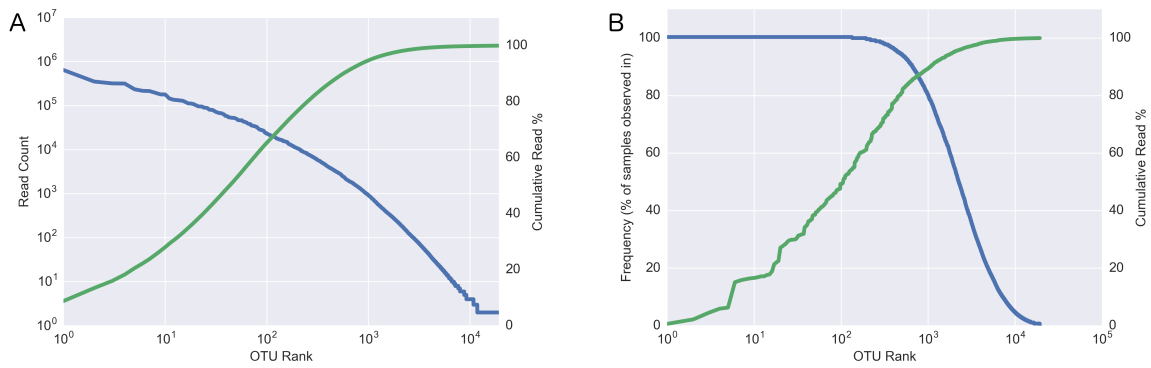


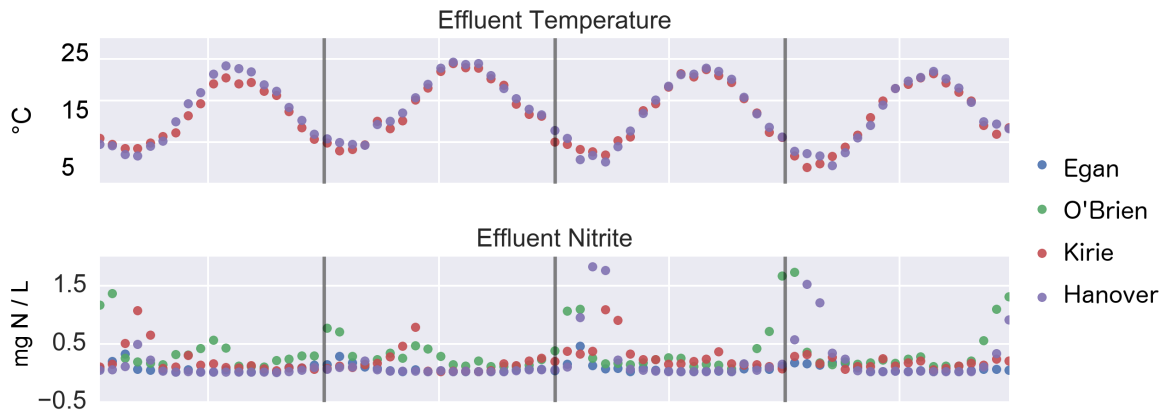
Supplementary Figures



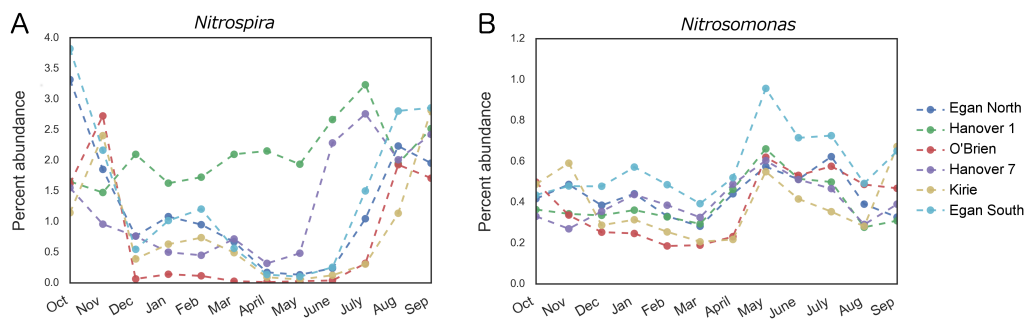
Supplementary Figure 1. Rank abundance curves sorted by OTU raw abundance (A) and OTU frequency (B). 134 OTUs were core to every time point, and accounted for over 51% of total reads. Similarly, the top 100 OTUs by absolute read abundance accounted for over 60% of all reads.



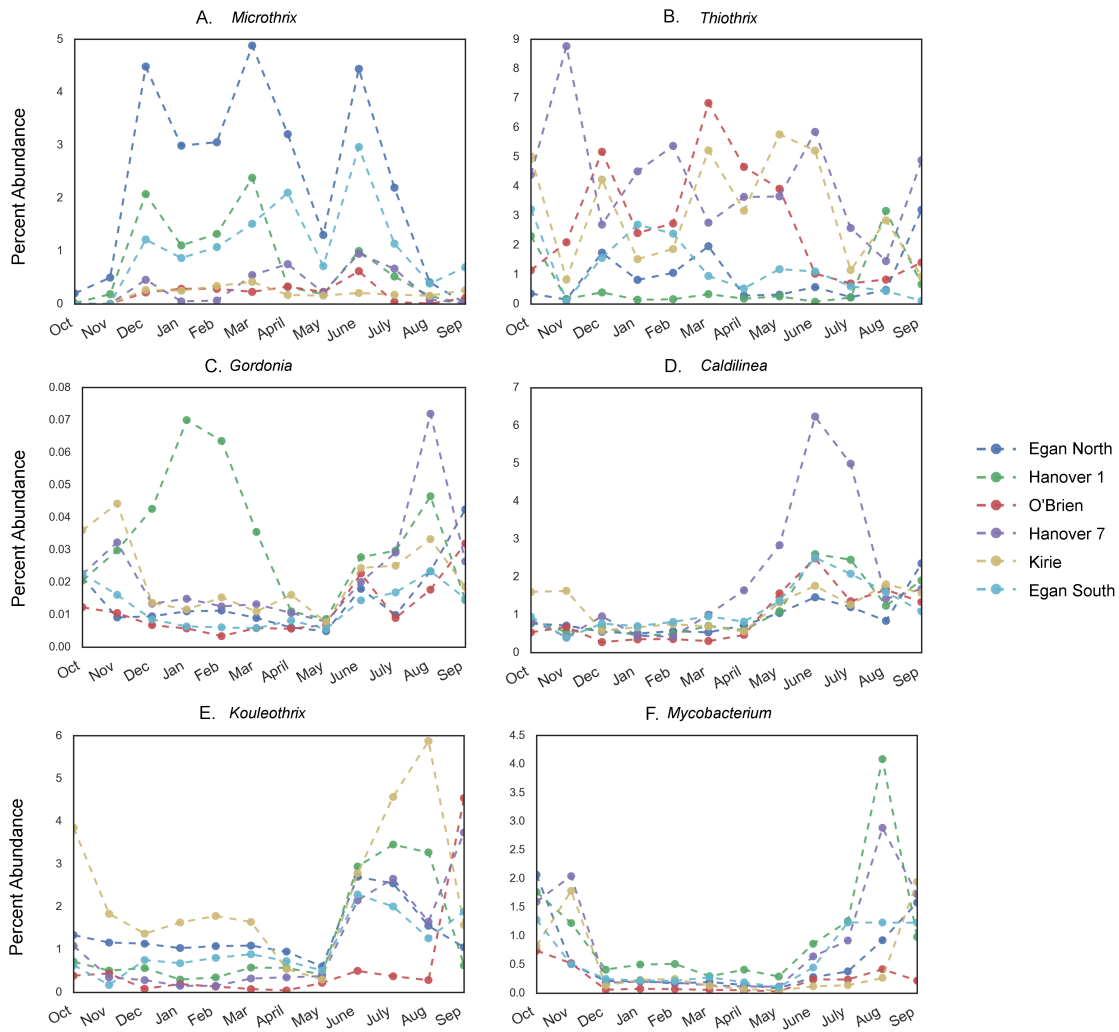
Supplementary Figure 2. Principal Coordinate Analysis of all samples, colored by season of origin. Samples roughly grouped by season with winter and spring together and summer and fall grouped.



Supplementary Figure 3. Seasonal temperature (top) and effluent nitrite concentration (bottom) over a four-year period showing seasonal effluent nitrite residual in multiple plants.



Supplementary Figure 4. Seasonal variability in *Nitrospira* and *Nitrosomonas* abundance at genus level. All but one reactor (Hanover 1) exhibited strong seasonal variability in *Nitrospira* abundance and relatively stable *Nitrosomonas* abundance.



Supplementary Figure 5. Seasonal variation in the top 6 most abundant bulking and filamentous genera. *Microthrix* (A) and *Thiothrix* (B) were the two most abundant genera and *Microthrix* was present during several bulking episodes. Other genera displayed synchronized variation.