

Abstract:

Climate Change is perhaps the greatest threat to life on Earth. As anthropogenic carbon emissions increase, the amount of methane released from wetlands increases. To combat large amounts of methane that are produced each day, organic pathways in organisms help regulate the levels of methane in biological ecosystems. However, usage of fertilizer in agriculture continues to stunt this naturally occurring regulation. To measure the effect that fertilizer has on methanotrophic microbes in a wetland environment, methanotrophic methane oxidation was monitored weekly. Soil was added to fourteen jars and fertilizer was added to half of those jars. The jars were incubated for a week before each measurement, emulating tropical wetland conditions; this allowed for more measurable results. Methane concentration was determined using a gas chromatographer (GC). The results showed that jars which contained fertilizer produced a significantly greater amount of methane ($p=0.0072$) compared to the control jars. These results can be used to better understand the effects of methane on an environment with high amounts of fertilizer runoff.