

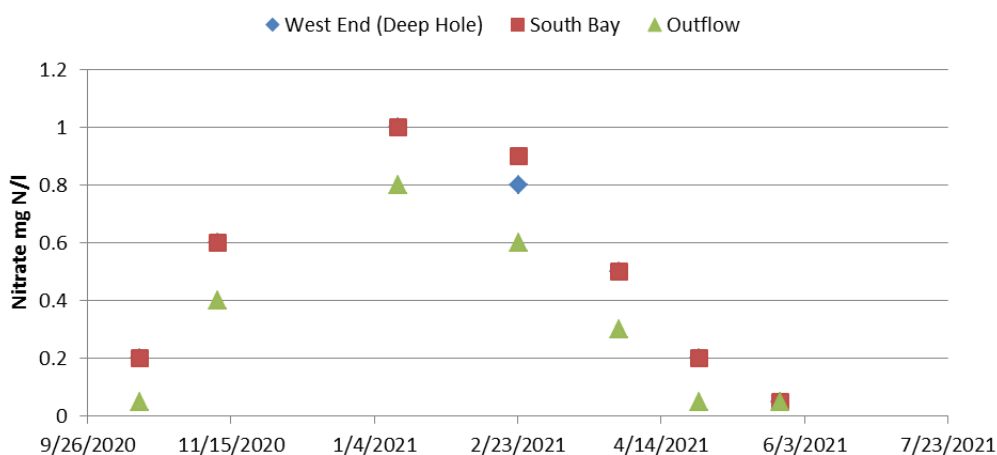
MEMO

To: Bill Pegler

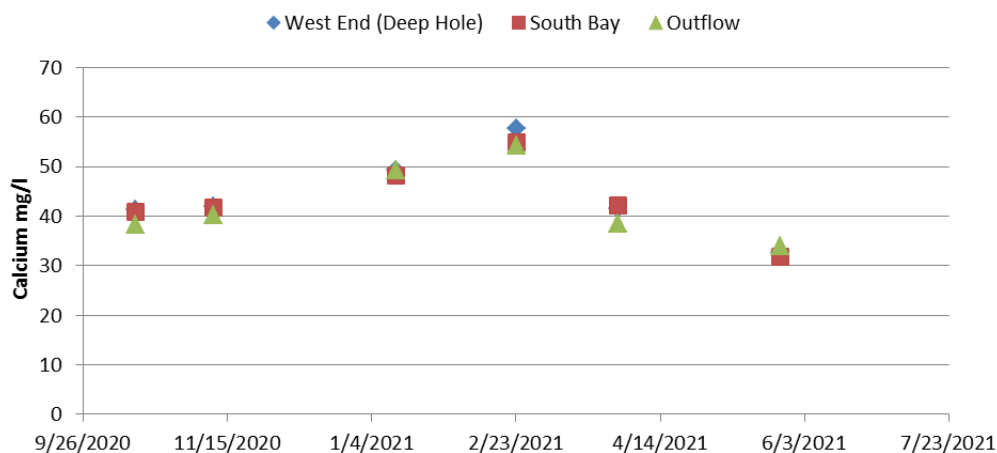
From: Paul McGinley

A First Look at the Peppermill Project Chemistry

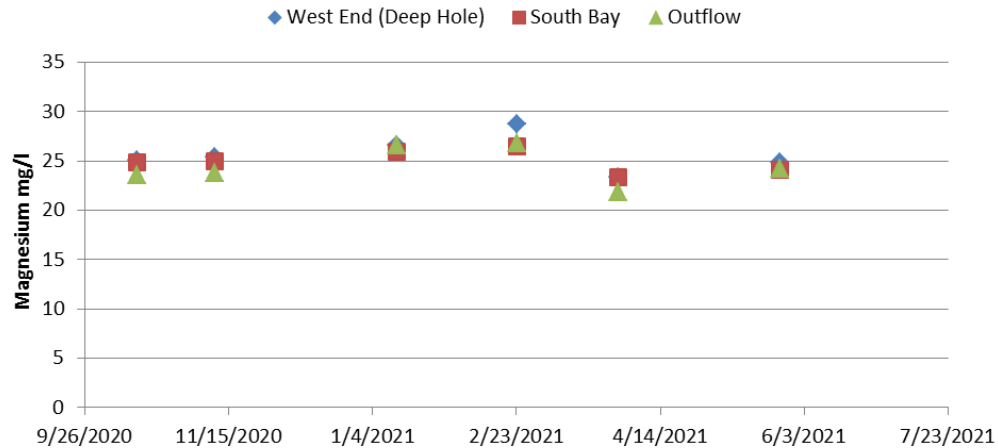
We plotted up the chemistry results from the start of your project. The first figure below shows the nitrate concentrations are consistent with our initial hypothesis in your lake project that nitrate-nitrogen is entering in groundwater but is difficult to measure as it is consumed as the lake warms and sunlight increases. That is consistent with consumption through plant or algal uptake in addition to denitrification by bacteria. Ultimately, we can link this to inflow measurements to gain some understanding of the total nitrogen loading to the lake.



The calcium concentrations follow a similar although less dramatic pattern as more calcium is converted to calcium carbonate in the lake on the plants and in the water.



We included magnesium as a much less reactive compound that would help us account for ice formation (that can concentrate compounds in the water as they do not freeze in the ice). Magnesium shows a much smaller change seasonally and is consistent with the nitrate change reflecting a biological uptake during the growing season.



Of course, we are just getting started with this project and I look forward to working further with this information and finding a time to discuss how we can use this in your lake management planning.