Total Organic Carbon in the South Puget Sound

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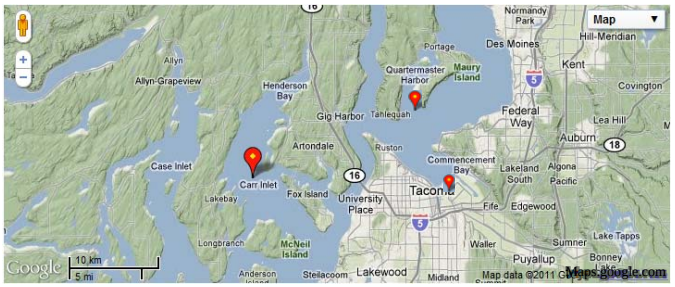
Abstract

Total organic carbon (TOC) indicates how much life is in an area by measuring any metabolic activities of a living organism, bacterial growth, or the decaying of an organic material. TOC derives from natural organic matter or synthetic sources that humans use on an everyday basis. This study will find the total percentage of TOC through a process of drying and burning mud from Quartermaster Harbor.

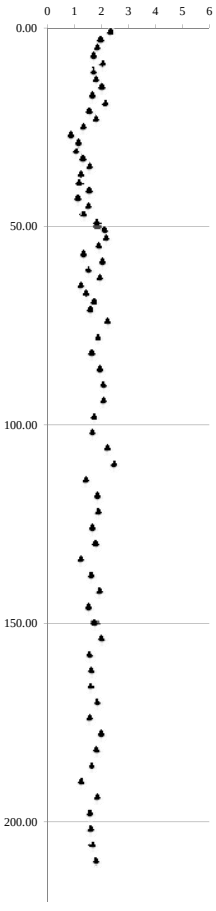
Methods

Samples were collected from the various bays in the Puget Sound and placed in whirly bags. Inventory was taken before the experiment began in order to not miss anything. The next step, take the empty crucibles and weigh them. After this step, place the mud into each crucible and weigh it again. After completing this task take the sample and place in the oven and dry it at 105°C for 5 hours and re-weigh the samples after a significant cooling time had been applied. The last step is to place them back into the oven and burn them at 650°C for 8 hours and allow a 12 hour cooling period before weighing. Dispose of the mud in the trash and wash and dry them in the oven for 30 minutes before continuing onto the next bag.

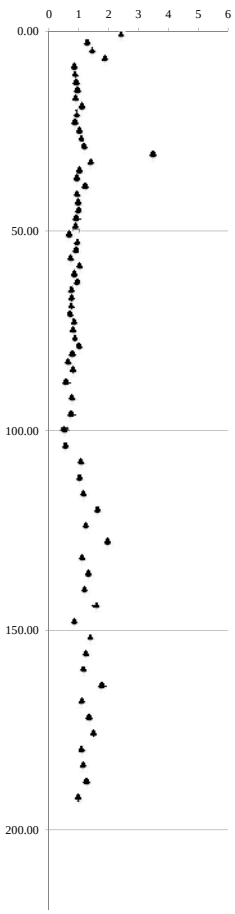
Results



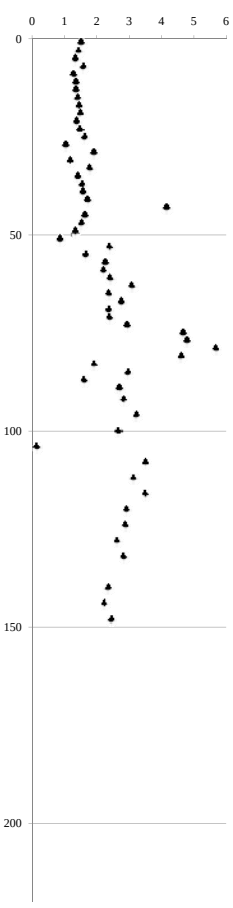
Carr Inlet



Quartermaster Harbor



Commencement Bay



Discussion

The results show definite trends from the cores that are sampled. Both Carr Inlet and Quartermaster Harbor shows a similar trend ranging in a majority of 1-2% which signifies that the sediment collected is inorganic. Commencement Bay displayed trends at the beginning of its core, but near the center of the core the data was all over the place ranging at maximum TOC % of 6% and a minimum of .1%. This could signify that the core could have been taken in a deeper more organic-rich part of the bay. The results showed some skew which might result in inaccuracy, but other than that it displayed similar trends as its counterparts. However, some of the samples tested from Commencement Bay may require a second run to clear up some confusion in the results. The results from Commencement Bay are not complete and may cause some confusion if not properly stated or interpreted. However, the results were successful in displaying the trends of total organic carbons found at the tested bays, and may require other tests to properly conclude the experiment and provide a more scientific answer to any questions about the three bays.

Future Work

Future work will include analyzing grain size distributions with a Particle Size Analyzer (PSA) PSA will give information on the energy it took to deposit the sediment; explaining how the grain sizes were distributed. Another thing we will be looking into is Lead-210 (Pb 210) dating.