

Lake Rotoehu sediments

Progress Report

26th March, 2013

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Lake Rotoehu sediments – Progress Report

- Sampling

9 cores taken (8 previous sites + one extra by accident) 4th February 2013.

Cores photographed, sub-sampled 1 & 2cm intervals.

Bulk density, Loss on Ignition, Pore water chemistry determined.

Digestion for sediment composition complete, results due shortly.

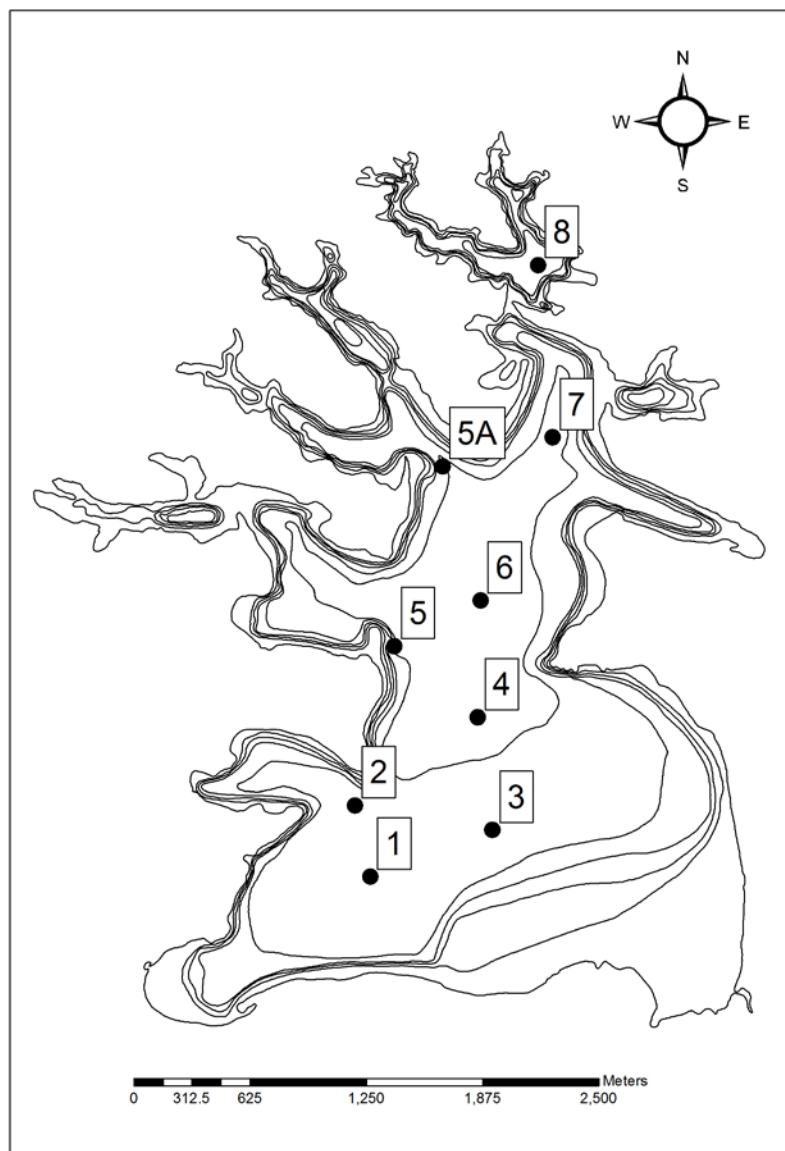
Pore water nutrients waiting for FIA analysis.

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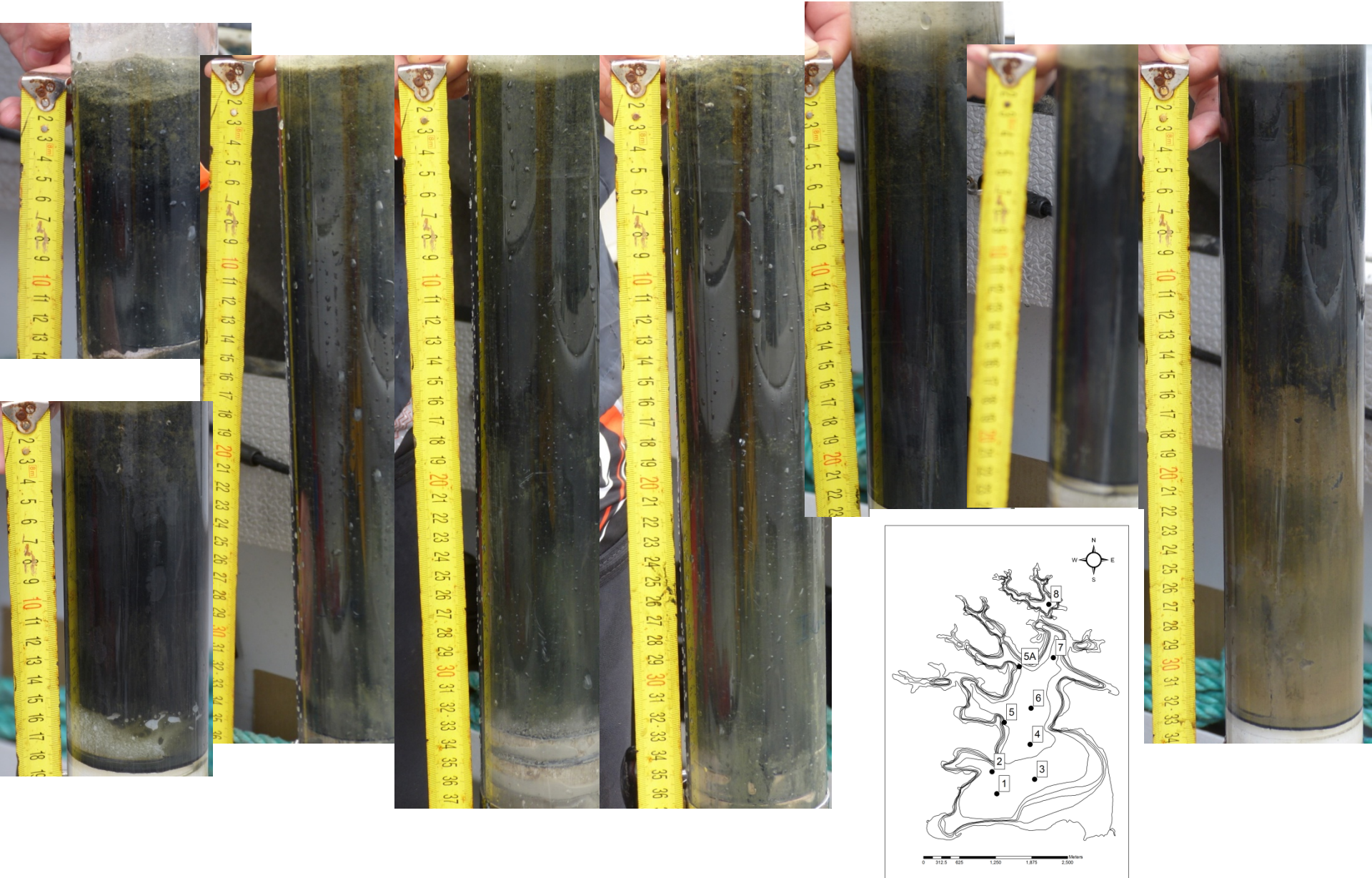
- Initial Observations

Sediments at site 8 were radically different to those from all other sites in the lake. All appeared to be diatomaceous ooze, but Site 8 were very much paler in colour with no darkening at depth.

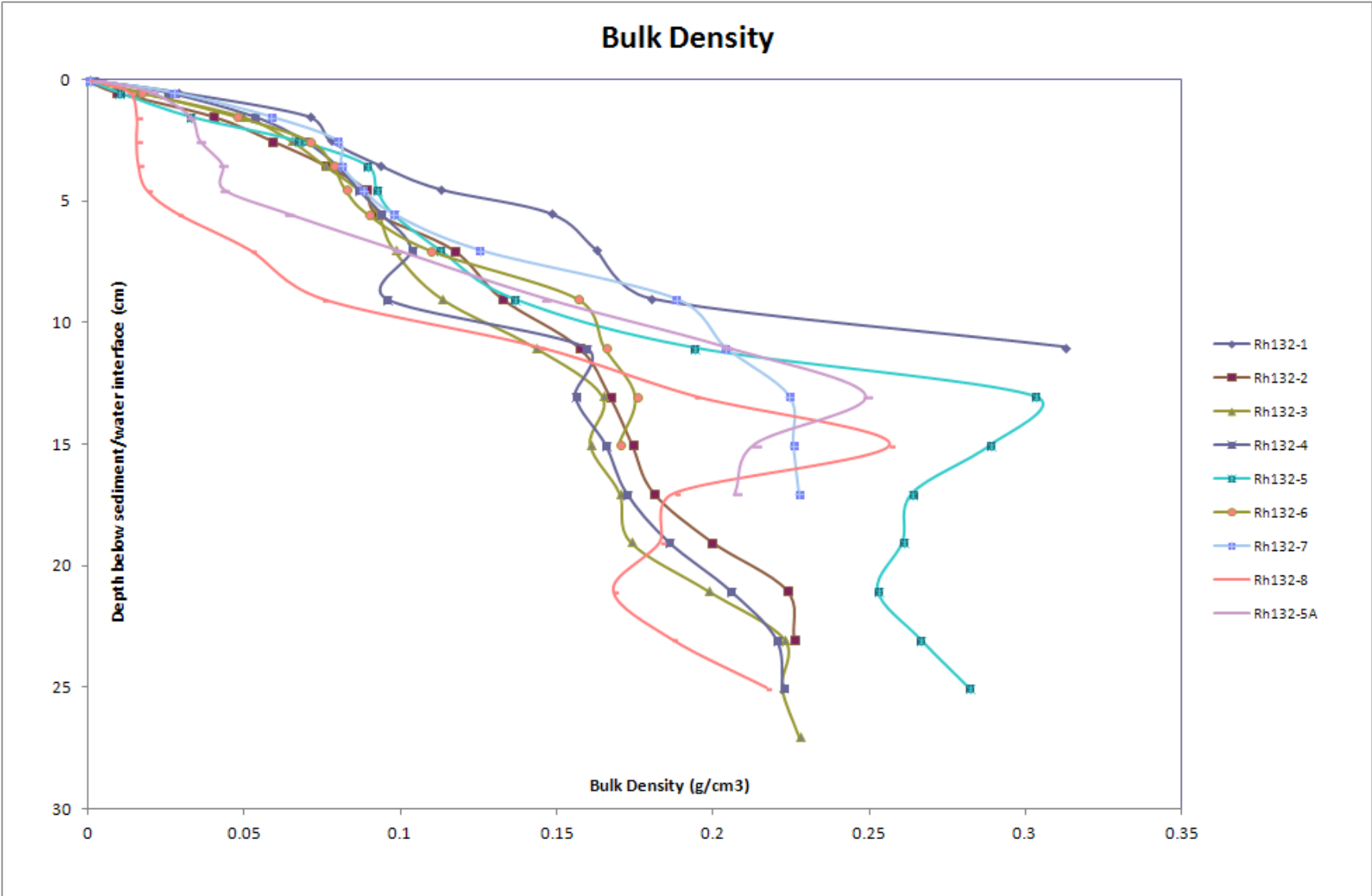
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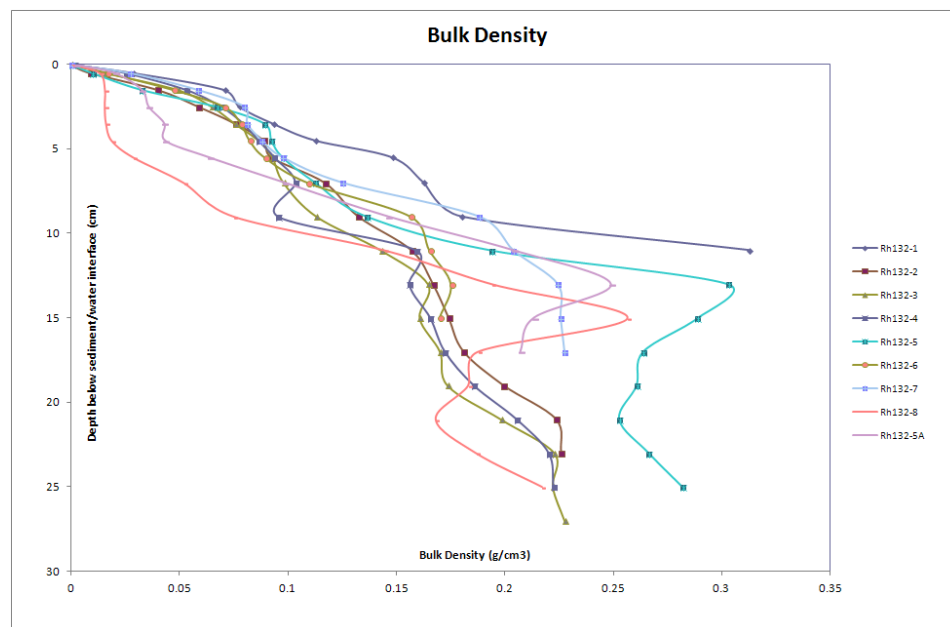


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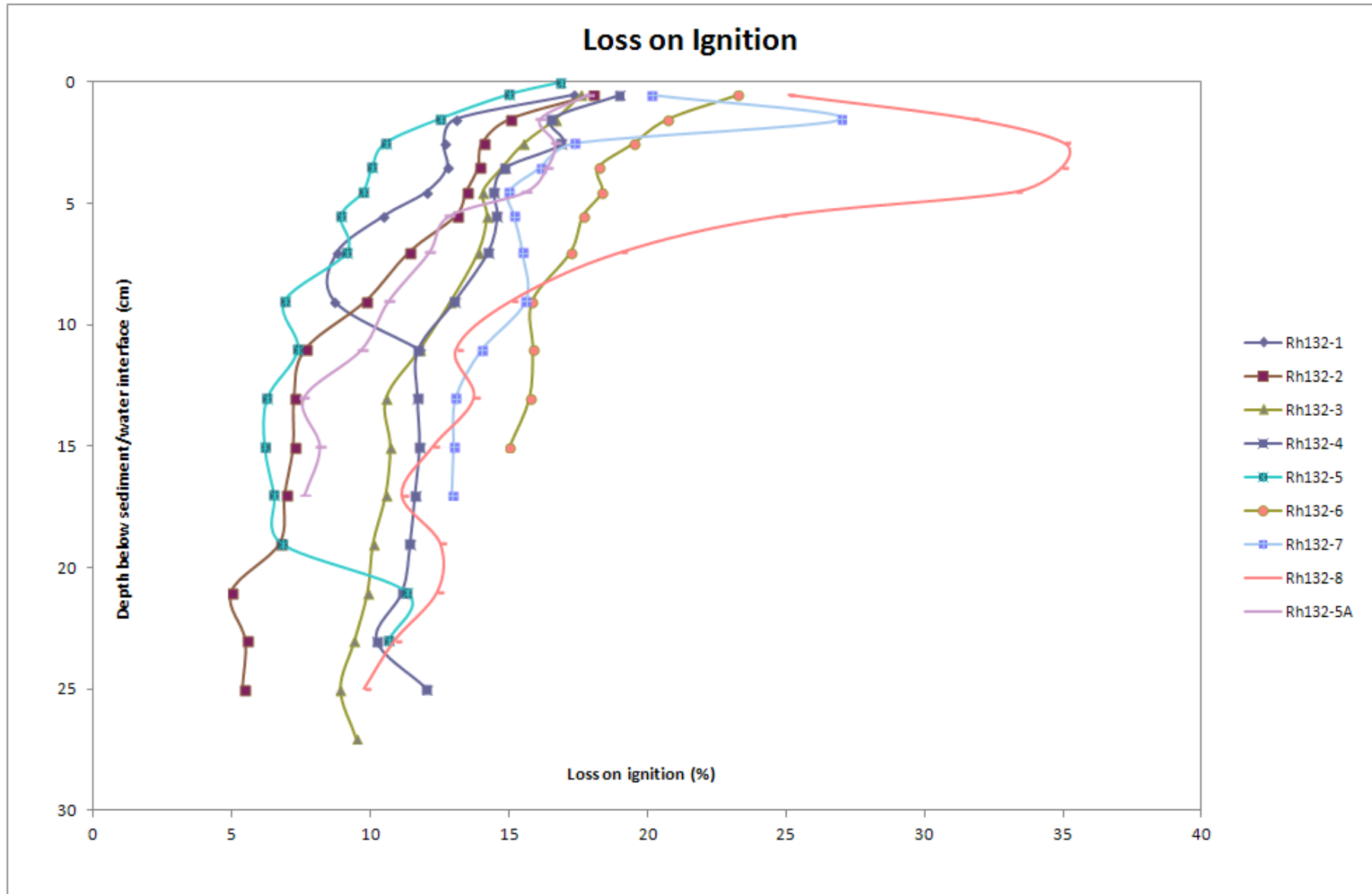


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Note Bulk Densities increase down core till the Tarawera Tephra.
Site 8 has extremely low Bulk Density



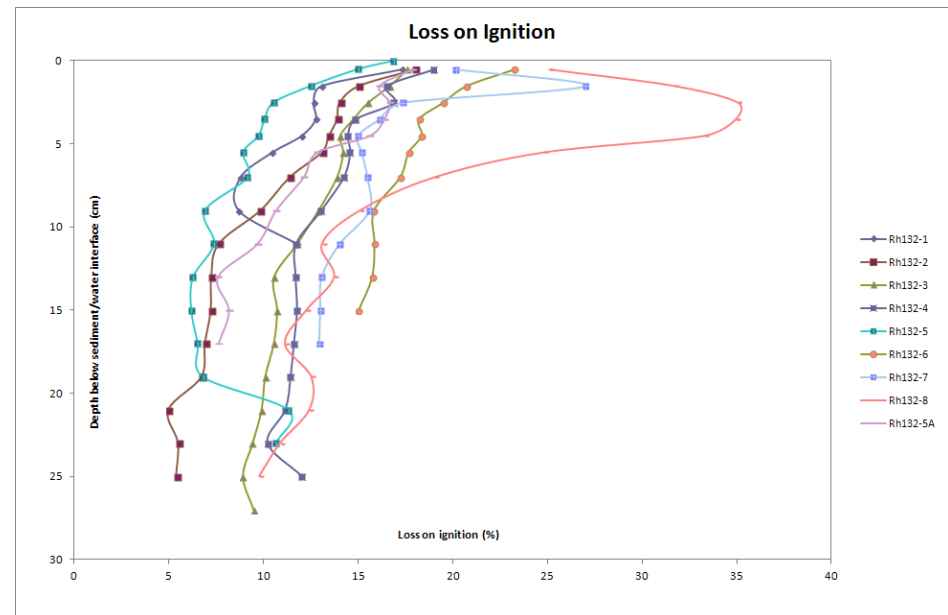
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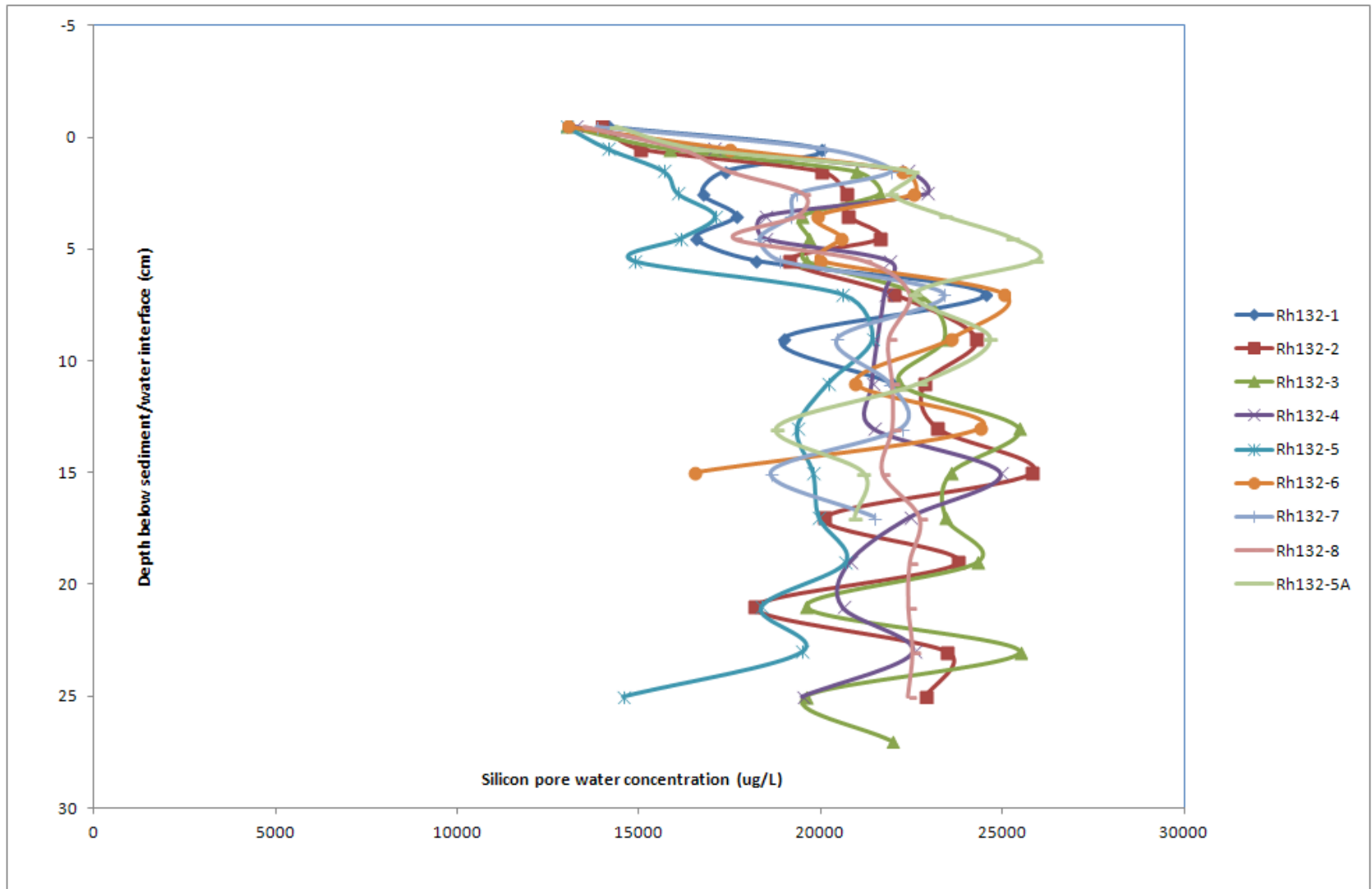
Note Loss on Ignition decreases down core (as organic carbon is metabolised)

Site 8 has abnormally high Loss on Ignition over the same depth range that it has unusually low bulk density)



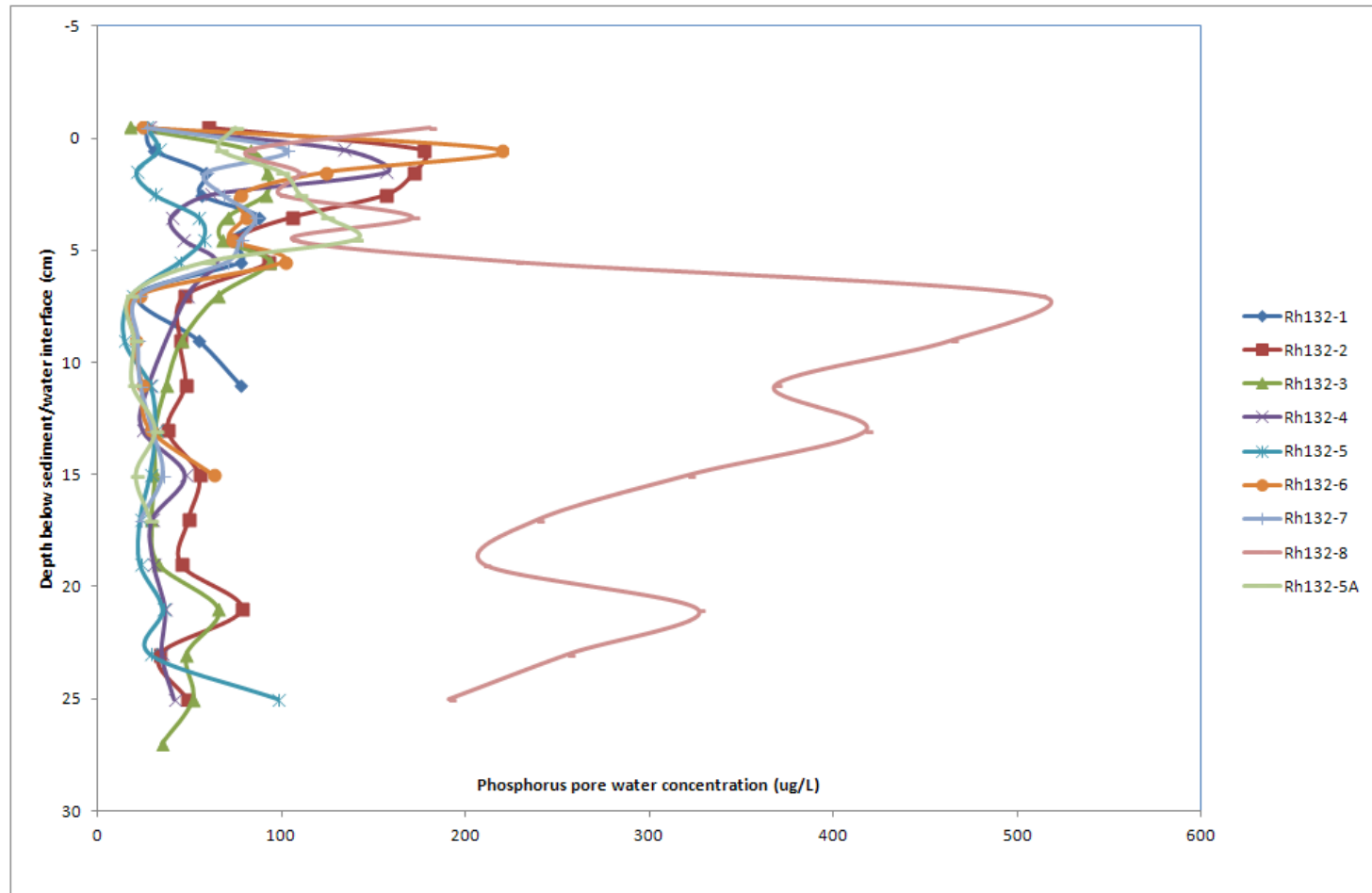
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Silicon recycling is minor compared to other TVZ lakes. Si supply probably exceeds that of nitrogen or phosphorus



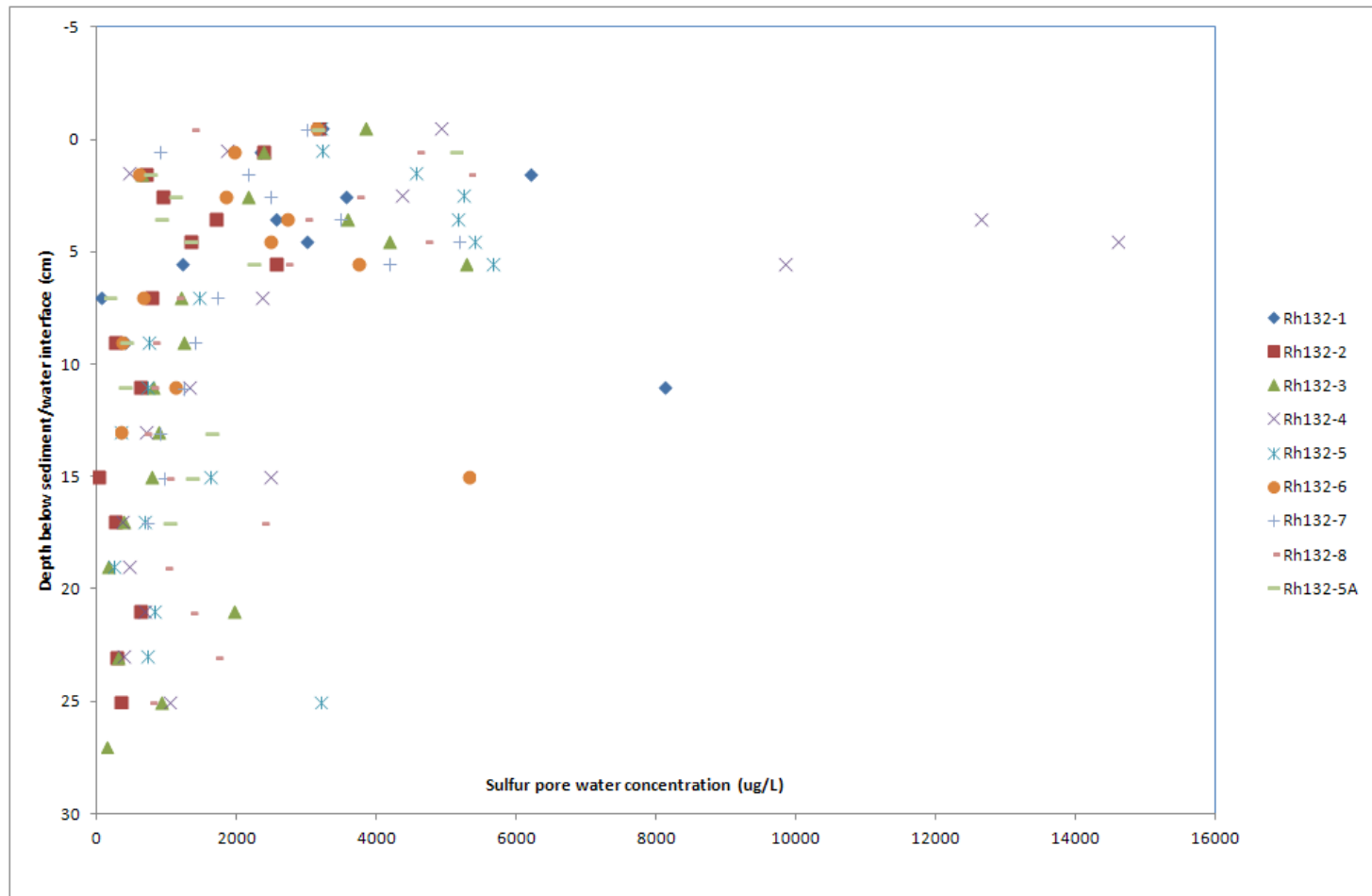
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Phosphorus is being recycled from all sites except 8. Here it appears to be being swept down



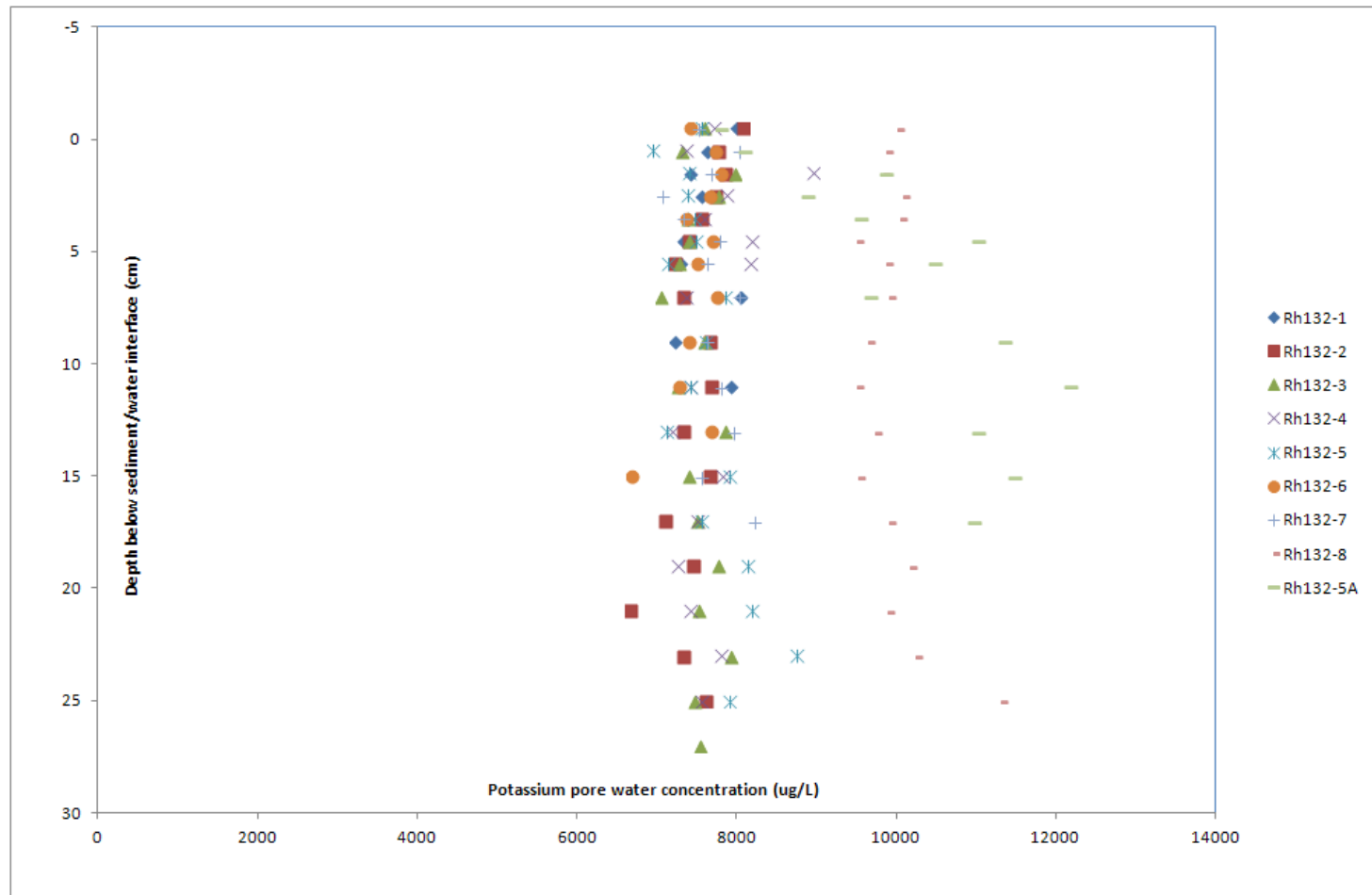
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Sulfur is probably being released from particulates near the sediment surface and reduced to sulfides at depth



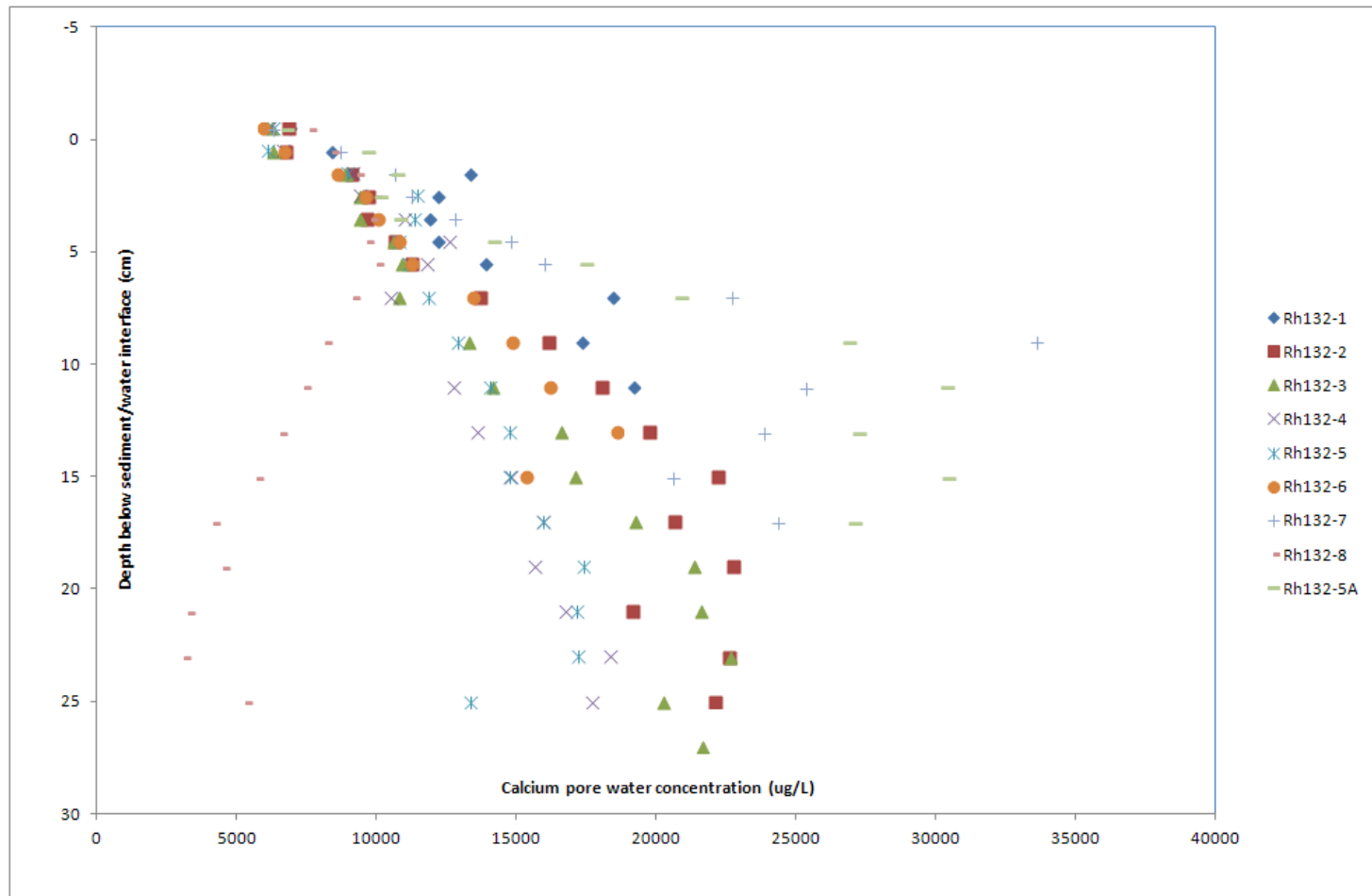
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Conservative ions such as potassium suggest possible geothermal fluid flow under Rh132-5A (Site 5). Why is site 8 uniformly higher than all the rest?



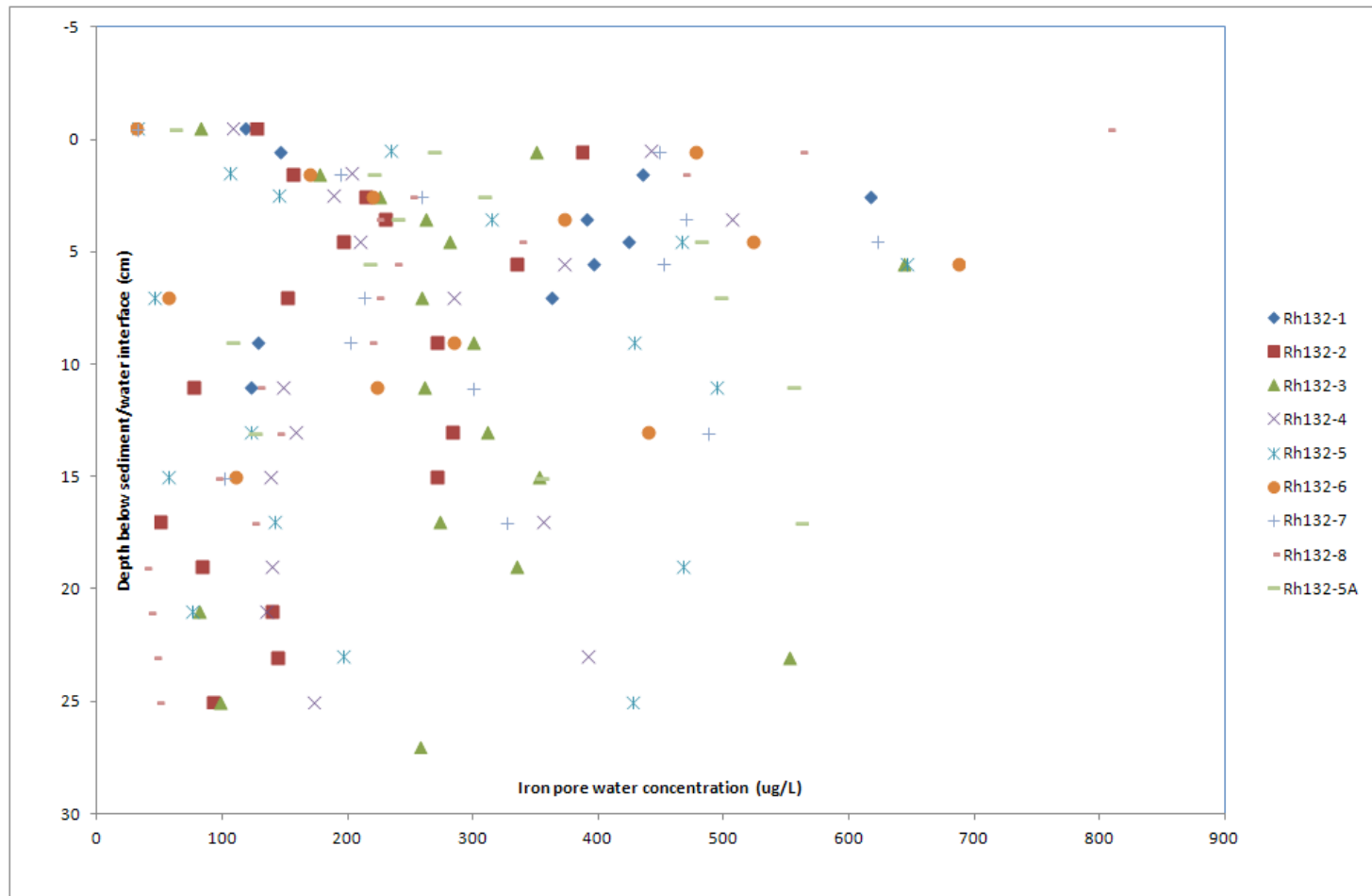
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Sites 5 and 8 also show anomalous calcium concentrations – why?



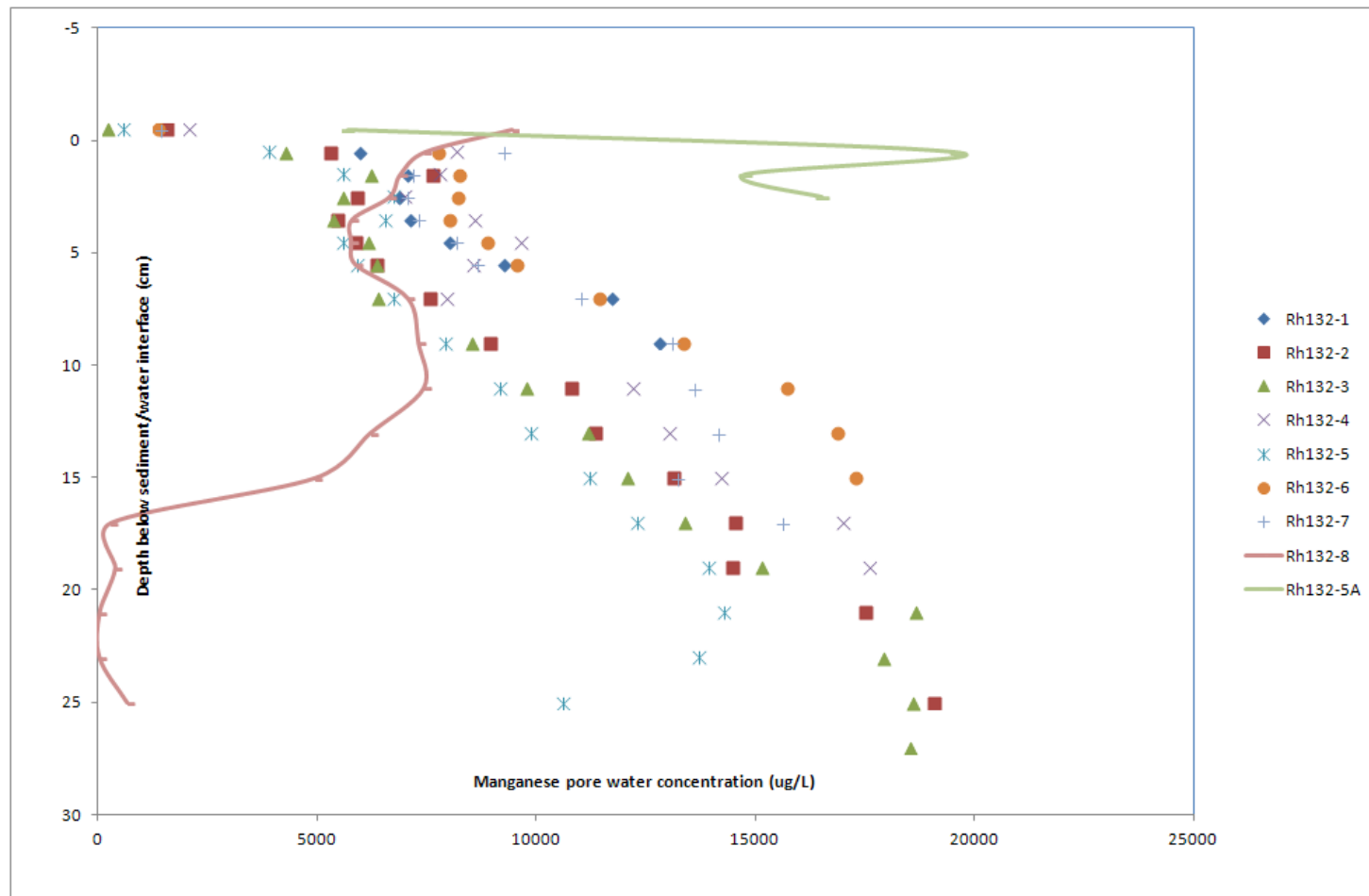
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Iron concentrations are low compared to other TVZ lakes and are probably suppressed by sulfate reduction to sulfide and pyrite precipitation



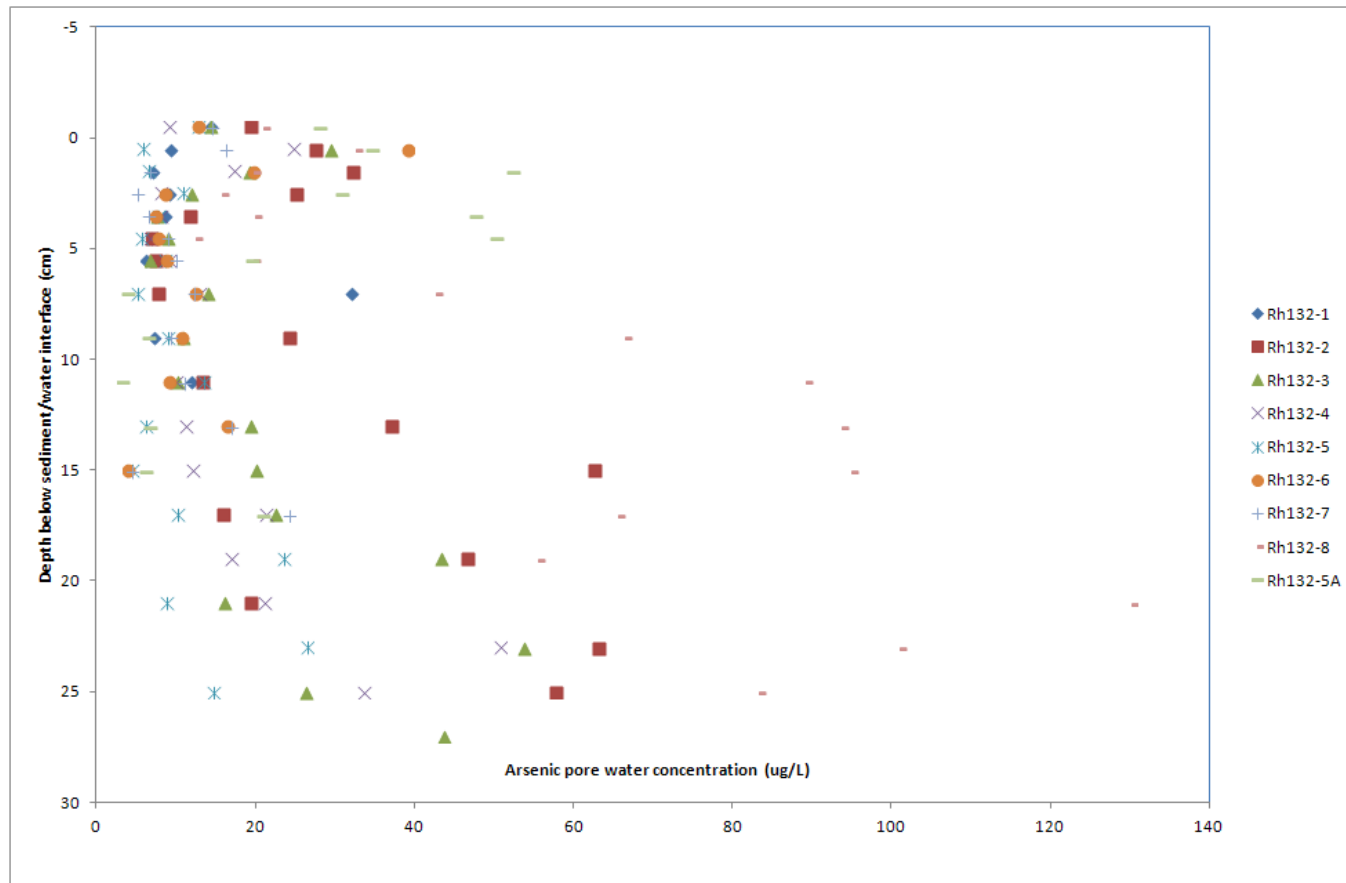
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Manganese concentrations are very high compared to other TVZ lakes. Sites 5 and 8 are anomalous. Site 5 exceeds the upper limit for icp-ms, while some reaction is consuming Mn at site 8



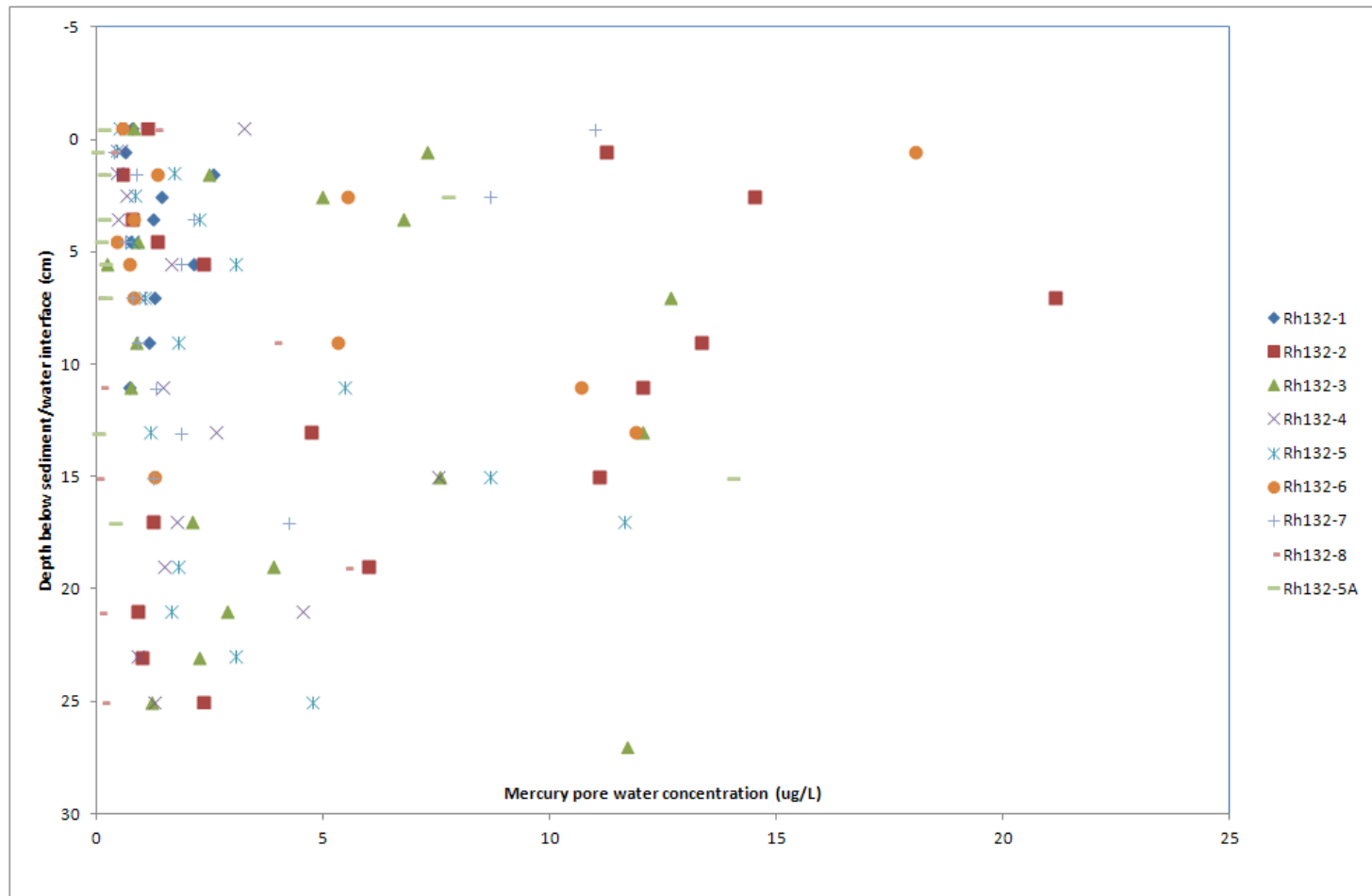
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Arsenic appears to be being recycled back into the lake resulting in the water immediately above the sediments exceeding safe limits for drinking water.

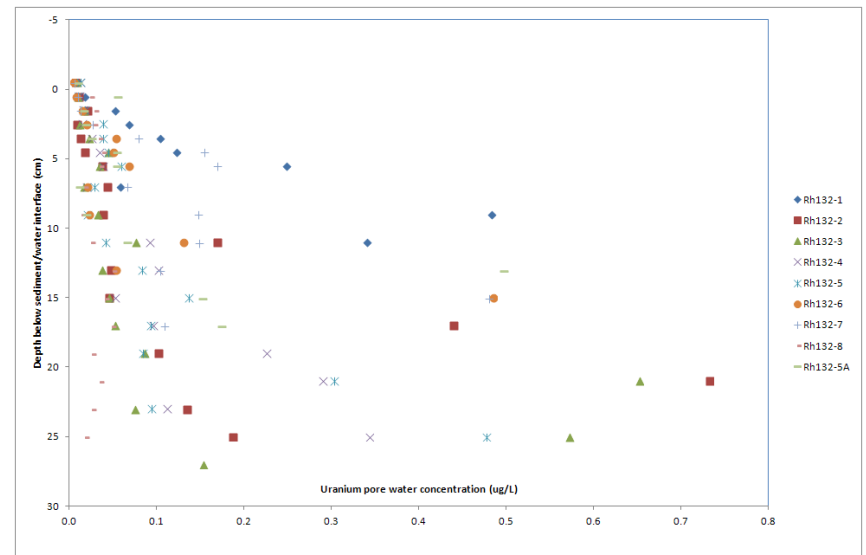


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Mercury also appears to be being recycled back into the lake resulting in the water immediately above the sediments exceeding safe limits for drinking water.



Neither lead nor uranium reach sufficiently high concentrations to be of concern.



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As in many TVZ lakes barium is being recycled from the sediments, possibly as barite dissolves following sulfate reduction. Again sites 5 and 8 are anomalous.

