Assessing the Applicability of Pb-210 Dating Technique in Selected Mangrove Areas in the Philippines

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Pb-210 BACKGROUND

A member of the Uranium-238 decay series

Half-life (t1/2) = 22 years

Naturally found in sediments and rocks that have Uranium-238, and also in the atmosphere (from Radon gas)

A promising tool for dating sediments on a timescale of about 100 years (**sediments can record many useful information: but it is essential to have an age control**)

Pb-210 DATING TECHNIQUE

Provides age control (for historical studies), to establish the timing of past environmental change

Tool for understanding changes happening in particular area of concern

Determines the accumulation of materials (e.g. sediment, nutrients, pollutants)

Gives information on possible sources, pathways, and sinks of sediments

Pb-210 DATING IN THE PHILIPPINES

In the Philippines, the Pb-210 Dating Technique has been used in Harmful Algal Bloom (HABs) studies in Manila Bay, Sorsogon Bay, Juag Lagoon, Bolinao, and Malampaya Sound-Palawan as well as in the sedimentation study of Laguna Lake.

This current study is a pioneering work in the estimation of sedimentation rates of selected mangrove areas in the Philippines using Pb-210 Dating Technique.

REFERENCES


ACKNOWLEDGEMENTS

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- Philippines: Research Initiative for Mangrove Management and Enhancement Strategies Against Natural Disasters (PRIME-SEAN)

IMPORTANCE OF MANGROVES

Economic Benefits
- Habitats / Nursing Areas
- Coastal Protection
- Carbon Sink / Storage
- Timber and Plant Products

Tourism

Philippine Mangrove Study Sites and Pb-210 Profiles

PRELIMINARY RESULTS

Initial Pb-210 results from these two mangrove areas revealed that Pb-210 is a promising tool for this type of environment. The Pb-210 profiles of the sediment cores (using the CIC Model) indicate that Pangasinan mangrove area has a much lower sedimentation rate than the Subic mangrove area.

<table>
<thead>
<tr>
<th>Core Location</th>
<th>Sedimentation Rate (cm/yr)</th>
<th>r² value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bani, Pangasinan</td>
<td>0.24 ± 0.03</td>
<td>0.82</td>
</tr>
<tr>
<td>Subic Bay</td>
<td>1.20 ± 0.30</td>
<td>0.69</td>
</tr>
</tbody>
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The difference in the sedimentation rates of the two areas could be due to the existing topographic, geologic, hydrodynamic and environmental conditions of the area. The factors responsible for the different sedimentation rates are still being investigated.