

Accumulation of organic rich sediments in a dendritic fluvial/lacustrine mire system at Tasik Bera, Malaysia: Implications for coal

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Laporan (Report)

About thirty people turned up for the talk on Tasik Bera by Dr. Steve Phillips and Prof. Marc Bustin from the Department of Earth and Ocean Sciences, The University of British Columbia, held at the Department of Geology, University of Malaya on October 7, 1996. Prof. Bustin started off by introducing how their interest in studying freshwater peat and coal deposits, some of which are of commercial value, was developed at UBC. A search for modern analogues brought Steve out to Malaysia about a year ago to conduct some preliminary field studies and sampling of the peats and sediments of Tasik Bera with Dr. Wan Hasiah Abdullah and Dr. Lee Chai Peng of the Department of Geology, University of Malaya. This talk is based on the results of the initial analyses carried out on the few samples obtained during that first trip. Steve and Marc were accompanied by Raphael Wüst, a post-graduate student interested in working on the Tasik Bera sediments on this trip.

Abstrak (Abstract)

The Tasik Bera mire system represents deposition of peat and peaty sediments within a dendritic fluvial drainage basin in the humid tropics. As such, it serves as an analogue for the earliest stages of coal deposition in low-relief topogenous coal swamps. Peaty sediments have been accumulating for at least 4,500 years in the lowest part of the basin, but accumulation rates and hence the thickness and lateral extent of the mire underwent a rapid increase and expansion beginning at about 660 years B.P. The sediments are highly variable, both vertically and laterally, the variations principally controlled by the type of vegetation dominant. Vegetation in turn is related to the degree of wetness of the site. Three distinct environments of deposition contribute peat with physical characteristics which can be related to coals. The limnetic environment, dominated by algae and easily degraded aquatic macrophytes, contributes very fine hemic peaty sediment with high fine silt content and a large algal component. The littoral environment is dominated by sedges and the woody shrub *Pandanus*, both of which have a large sub-aqueous biomass, and are quite resistant to degradation. Sediment from this environment is woody, hemic to coarse hemic, with a moderate to high very fine silt content and a much smaller algal element. Forest swamps, which occupy most of the mire area, contribute woody, fibric to hemic peaty sediments with low to moderate mineral matter content in the form of clays and very fine silt. Succession from both limnetic to forest swamp, and the reverse, is recorded in cores from different sites. In coals these transitions would be manifest as both brightening-upward (algae-dominated peat to woody peat) and dulling-upward (the reverse sequence) trends, the first in the topographically lower part of the basin, the second in the middle reaches. No part of the mire yet studied is approaching oligotrophic conditions. Allowing for a compression ratio of 5:1, thin, stony coals from the Tasik Bera mire would be laterally discontinuous and would vary from about 1 m in thickness at channel margins, tapering out to nothing as they onlap the interfluves.

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