Abstract Book

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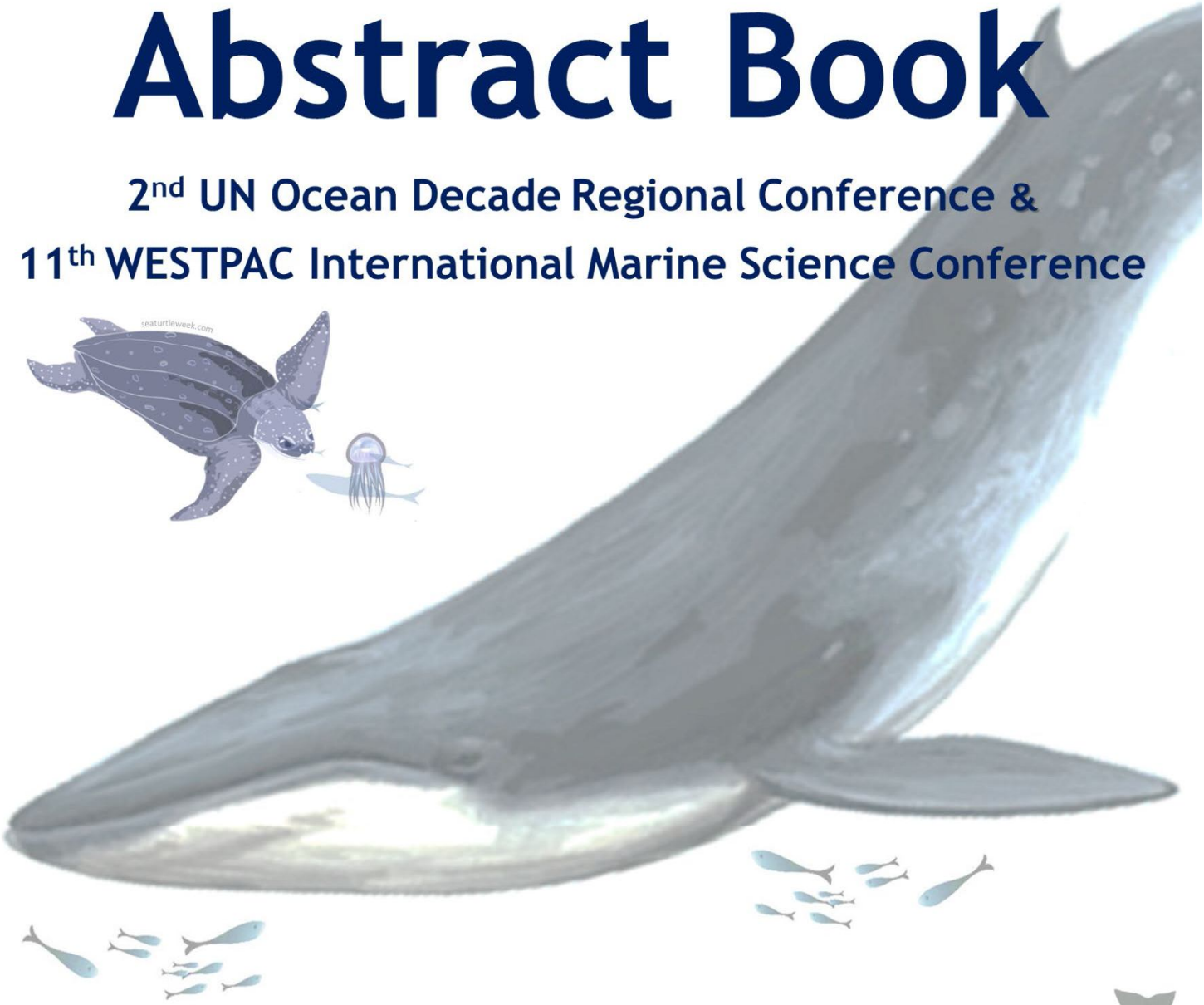

22–25 April 2024

The Berkeley Hotel Pratunam, Bangkok, Thailand

Time	Presentation Titles	Speakers
14:15–14:30	Integrated assessment of total mercury distribution in water, sediment, and biota of Thai river estuaries	Prabakaran Krishnamurthy, *Chulalongkorn University, Thailand*
14:30–14:45	Environmental disturbances could affect sediment trapping in tropical coastal seagrass beds	Ow Yan Xiang, *National University of Singapore, Singapore*
14:45–15:00	Chemical weathering in the Mekong river basin: clay mineralogy and element geochemistry of lower-reach river sediments	Pham Nhu Sang, *Tongji University, China*
Section 3		
15:30–15:45	Plio-pleistocene structures and deposition in the southern Java Sea	Susilohadi Susilohadi, *BRIN, Indonesia*
15:45–16:00	Sea level and East Asian monsoon influenced chemical weathering records in the southern South China Sea over the past 21 ka	Hongchao Zhao, *Tongji University, China*
16:00–16:15	Optical properties of dissolved organic matter from Bangpakong River to Sichang Island, Thailand	Warasyn Boontanapibul, *Chulalongkorn University, Thailand*
16:15–16:30	Multi-annual change of Jakarta Bay's carbonate system	Camellia Kusuma Tito, *IPB University, Indonesia*
16:30–16:45	Chromophoric dissolved organic matter in Bangpakong estuary, Thailand	Chirawat Duangthong, *Chulalongkorn University, Thailand*
16:45–17:00	Investigating the geochemical characteristics and associated toxicity of bioavailable metals around Singapore intertidal zones by diffusive gradients in thin films (DGT)	Iravati Ray, *Jadavpur University, India*

Chemical weathering in the Mekong river basin: clay mineralogy and element geochemistry of lower-reach river sediments

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Abstract

Chemical weathering of parent rocks in river basins plays a significant role in controlling the global geochemical cycle and climate change, especially in the world's largest river basins such as the Mekong River basin in the tropical region. However, the chemical weathering process of the Mekong River basin is still not well understood. In this study, clay mineralogy and major/trace-element geochemistry of fluvial sediments (clay, silt, and sand fractions) collected from the lower Mekong River basin (Cambodia and Vietnam) were utilized to investigate the sediment provenance and chemical weathering process. Major-element compositions of clay, silt, and sand fraction sediments from both the mainstream and tributaries consist of dominant SiO_2, Al_2O_3, and Fe_2O_3, (84%, 89%, and 95%, respectively) and minor K_2O, Na_2O, MgO, CaO, TiO_2, P_2O_5, and MnO. The clay mineral assemblages in mainstream sediments are high in illite (36%), moderate in kaolinite (28%) and chlorite (26%), and low in smectite (10%), whereas those in tributary sediments are high in smectite (37%), moderate in kaolinite (26%) and chlorite (22%), and low in illite (15%). Based on clay mineralogy and elemental geochemistry, river sediments of the mainstream in the lower reach may be derived mainly from the lower part of the middle reach of this basin, with secondary contributions from the upper and lower reaches as well as the upper part of the middle reach. The clay mineral proxies (smectite/(illite + chlorite) and kaolinite/(illite + chlorite)) combined with elemental geochemistry (CIA, $\alpha^{Al}E$ values, and weathering trends) of clay fraction sediments indicate intensive chemical weathering in the lower and middle reaches. High-relief topography and cold and dry climatic conditions in the upper reach result in high illite and chlorite of the soil and moderate chemical weathering. Relatively, the chemical weathering intensity increases from the upper reach to the middle reach and further to the lower reach. Tectonics in the middle and upper reaches of the Mekong River basin play the most important role in controlling weathering and erosion processes, while the East Asian-Indian monsoon climate condition with warm temperatures and predominant rainfall throughout the year and the lithology are the main forcing factors for the intensity of chemical weathering in the lower reach.

Keywords: clay minerals, major elements, trace elements, chemical weathering, Mekong River.