

Seasonal Change of Water Exchange System between the Gulf of Thailand and South China Sea

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Abstract

The influence of monsoon wind on water circulation and water exchange in the Gulf of Thailand (GoT) with the South China Sea (SCS) was analyzed by using M.V.SEADEC2 cruise data (August-October2018), globally standardized air-sea physical data from multiple satellite and in situ observations (COPERNICUS), and ocean circulation model from ROMS (Regional Ocean Model Systems). During SW monsoon, cold dense water in deepest central area and western coastal area along Malaysia Peninsula from cruise and COPERNICUS data indicated Ekman-transport moves GoT surface water into SCS, while cold dense SCS water in deep layer move northward into the GoT from Malaysia Peninsular as entrainment flow. During NE monsoon, strong density front between cold saline water from SCS and warm less-saline water in GoT was found around central area of mouth of GoT. Ekman-transport drives SCS water to flow into GoT, while less density water in GoT blocks SCS water to enter at surface. Main part of SCS water flow out southward and others flow into GoT along Malaysia Peninsular. However, blocked SCS water can enter into GoT as density flow, sinking deeper and enter along NE coast (Vietnam and Cambodia coast). Conclusion, Ekman transport acts as dominant factor for transferring surface water and density flow plays an important roles in water exchange for deep layer.

Keywords: water exchange, monsoon, Gulf of Thailand, South China Sea

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