

Estimating the Origin of Water Using Stable Isotopes over Indochina

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The daily precipitation and isotopic compositions from August to November in 2001 were observed at ChiangMai, Bangkok, and Phuket in Thailand. The $\delta^{18}\text{O}$ variability was well reproduced by the Rayleigh-type Isotope Circulation Model (ICM), which correlation coefficients between observed and simulated values were 0.54, 0.70, and 0.70 for ChiangMai, Bangkok, and Phuket, respectively. The origin of water was estimated by the Colored Moisture Analysis (CMA) that is ICM with a tagged-water transport scheme. From the result of CMA, there are clear transition of water origin for withdrawal of the Asian Monsoon. Most precipitable water are derived from the Indian Ocean (IDO) for mid Monsoon and Java Sea and Pacific Ocean (JVS+PFO) for post Monsoon. Water from Land (LND) for mid Monsoon at ChiangMai is much greater than those of Bangkok and Phuket. The percentages of IDO to total column water for mid Monsoon at three stations are increasing from north to south depend on the strength of the Asian Monsoon activity. Also, the percentages of LND for post Monsoon at three stations are increasing from coast to inland depend on the evaporation from land. Spatial distributions of water origins around Indochina were examined for withdrawal of the Asian Monsoon, the transition of water origin from IDO to JVS+PFO is clearly shown over Indochina. Spatial distributions of precipitation on land over Indochina become smaller during whole period, while those on adjacent sea is not corresponding to the distribution of each origins.

Keywords: stable isotope; Asian monsoon; origin of water

References

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