

# Analysis of variation and relation of climate, hydrology and water quality in the lower Mekong River

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**Abstract:** In order to determine the influence of climate and hydrology on water quality of the lower Mekong River, the long term monitoring data (from 1985 to 2004) of climatic, hydrological and water quality variables were analyzed. In general, water quality was 'good' or 'very good' for most of the investigated water quality parameters including DO, pH, conductivity, nitrate, phosphate and total phosphorus. All climatic and hydrological elements as well as most of the water quality parameters varied seasonally. Throughout the 18-year period, only evaporation, water level and TSS showed a significant pertinent trend. ARIMA models results reveal that among climatic and hydrological parameters, water quality could be effectively predicted from the data of discharge flow and precipitation. The results showed good  $R^2$  ( $\geq 0.7$ ) estimation between predicted and observed values for TSS, alkalinity and conductivity which are the chemically and biologically conservative parameters. For other water quality parameters such as  $Ca^{2+}$ ,  $Mg^{2+}$ ,  $Si$ ,  $Cl^-$ ,  $NO_3^-$ , and  $SO_4^{2-}$ , the predicting results by ARIMA model were reliable in shorter period than the above three mentioned variables. © IWA Publishing 2010.

**Author Keywords:** ARIMA; Climate; Hydrology; Lower mekong river; Water quality

**Index Keywords:** Analysis of variations; ARIMA; ARIMA models; Climate; Discharge flow; Long term monitoring; Mekong River; Total phosphorus; Water quality parameters; Alkalinity; Hydrology; Phosphorus; Rivers; Water levels; Water pollution; Water quality; calcium ion; magnesium ion; nitrate; phosphate; phosphorus; river water; silicon; sulfate; surface water; climate variation; dissolved oxygen; hydraulic conductivity; hydrological modeling; nitrate; pH; phosphate; phosphorus; water quality; alkalinity; article; chemical analysis; climate; concentration (parameters); conductance; environmental monitoring; evaporation; flow rate; pH; precipitation; prediction; river; surface water hydrology; water quality; Mekong River

Year: 2010

Source title: Water Science and Technology

Volume: 62

Issue: 7

Page : 1587-1594

Link: [Scopus Link](#)

Chemicals/CAS: calcium ion, 14127-61-8; magnesium ion, 22537-22-0; nitrate, 14797-55-8; phosphate, 14066-19-4, 14265-44-2; phosphorus, 7723-14-0; silicon, 7440-21-3; sulfate, 14808-79-8

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ISSN: 2731223

CODEN: WSTED

DOI: 10.2166/wst.2010.449

Language of Original Document: English

Abbreviated Source Title: Water Science and Technology

Document Type: Article

Source: Scopus

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