



Influences of terrestrial determinants on the stability of surface water quality response to climate drivers

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Water quality mainly depends upon the terrestrial characteristics of landscape. The current study was conducted to unveil relationships between climate elasticity of water quality (CEWQ) and terrestrial determinants based on 13 monitoring sites from three typical watersheds of Yukon, Mekong and Murray. Anthropogenic biomes and surficial geological composition was computed at basin scale. It was found that the response pattern of (T, TN-UF) and (T, water temperature) are exclusively characterized by temperature. Temperature elasticity is variable in space as compared to precipitation elasticity. The results implied that anthropogenic biomes are stronger determinants as compared to surficial geology when analyzing their relationships with CEWQ. Some important association was found between CEWQ and anthropogenic biomes which includes: positive association of dense settlements with (P, NOX-F) and (P, P-F), positive linkage of croplands with (P, NOX-F) and (P, NH4-F), negative relationship of rangelands with (P, NOX-F) and (P, DOC), and negative linkage of rangelands with (T, P-UF) and (T, water temperature). Similarly some important association was found between CEWQ and surficial geology which includes: negative linkage of clay with (P, P-F) and negative relationships of gravel and clay with (T, P-UF). This indicates that dense settlements and croplands are the main factors influencing the stability of CEWQ, and limiting high flow volume during rain will be critical for enhancing water quality.