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The Flood Effects on Infiltration Rates in a Disconnected Stream

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In theory, infiltration rates increase linearly with river water depth, as indicated by Darcy's law. Previous studies show average infiltration rate in a disconnected stream was doubled during the summer flood months than the winter and estimate 40% of the total aquifer input was from river flooding infiltration. However, some studies suggest an increase in water depth will compress the clogging layer, which then becomes less permeable. Infiltration rates did not increase linearly with water depth and sometimes actually decrease, as had been observed in field cases and column tests. In a flood event, an older clogged streambed may be eroded but a new one will be forming quickly while the concentration of suspended load is very high. Our purpose is to understand the flood effects on infiltration rates in a disconnected stream. We use diurnal temperature time series to determine the daily streambed infiltration rates during several flood events in a disconnected stream, the Chohsui stream, in Central Taiwan. Our data do not support the flood dramatic increasing infiltration rate theory. The infiltration rates were also low in the flooding season because of the streambed was clogged very quickly with large load of suspended particle. However, the total recharge amount to aquifer would be increase because the increase of wet perimeter in the stream during a flood period.