

Assessment of the near surface hydrogeological controls on discharge of a 'Chalk river' in Hertfordshire, UK

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A Chalk river is considered to be significant due to its international rarity, subsurface karstic features and flow regime. The River Mimram in Hertfordshire is an example of a groundwater-fed Chalk stream in south-east of England which is characterised by winterbourne, low flows due to abstraction and drought. The study area is predominated by Cretaceous Chalk and overlain by drift deposit such as glacial till and buried channel deposits which include glaciofluvial gravels, sands and silty clays.

The understanding of the effect of buried channel deposits on recharge (baseflow) and discharge of Chalk rivers is important in evaluating their flow regime since these deposits are of hydrogeological significance. Three locations have been chosen based on geological map data indicating changes in superficial deposits along the river. Discharge measurements using the velocity-area method have been undertaken in order to establish the relationship between flow rates and the geology of the area. Permeability measurements of the river bank deposits' field saturated hydraulic conductivity using a constant head permeameter was carried out to determine the coefficient of permeability of the superficial soils.

Preliminary results obtained appear to show anomalous discharge rates which seems to contravene the conventional increase in downstream flow which might have been partially influenced by abstraction and also by variation in the permeability of the buried channel deposits. It is hoped that this study will provide a better understanding of the role of near surface geological controls on the flow of Chalk rivers.

Biography

Omotayo Ayeni holds an MSc in Geology (hydrogeology & engineering geology) from the University of Ibadan and BSc Geology from the University of Nigeria respectively. He is currently studying MSc Water & Environmental Management at the University of Hertfordshire. He is a student member of CIWEM and SEG.

The research is being undertaken as a project supervised by Dr Tim Sands, MSc Programme Tutor.

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