

focus on **NRM** research

How quickly do floods recharge aquifers?

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What are you researching?

After prolonged drought, wet periods between 2010 and 2013 provided opportunities for replenishing groundwater resources. Yet observations reported around the country shows the extent of groundwater level recovery varies from site to site.

This research studies the rate of recovery of a depleted aquifer under variable climatic conditions. Fundamentally, it is aimed at quantifying the relative importance of stream recharge via stream channels and diffuse recharge over the land surface and to identify the governing processes and suitable conditions for recharge.

What have you found?

Groundwater level record shows recovery across the study area, which has confirmed that intra-annual recharge events provide replenishments of the groundwater resources.

Moreover, groundwater abstraction in the preceding years had caused large cones of depression that created a thicker unsaturated zone by 1-4 m.

This zone allowed for additional river recharge and thus encouraged flood capturing. However, semi-confined aquifers at greater depth receive less recharge than shallow aquifers. Carbon dating shows natural replenishment in those deeper aquifers takes much longer than human lifetime.

Why is it important?

Water storage in aquifers beyond the root zone does not incur evapotranspiration losses and has no space requirements on the surface.

Developed river valleys have the potential for managed

aquifer recharge of flood waters, since pumping encourages groundwater capture. Yet, the dominating recharge processes, pathways and aquifer stratigraphy determine the efficiency and sustainability of underground storage, which need to be refined before the economics of managed aquifer recharge can be examined.

How can I apply the research/what should I do about it?

The preliminary results suggest more vertical flow into the deeper aquifer need to be promoted perhaps by engineered solutions. Furthermore, land management need to facilitate focused recharge through natural groundwater recharge zones, such as oxbow lakes and wetland near river channels.

Where do I go for more information?

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