

# Nutrient movement through dynamic aquifers of the humid tropics

**Paul Nelson**

School of Earth and Environmental Sciences, JCU  
Department of Environment and Resource Management

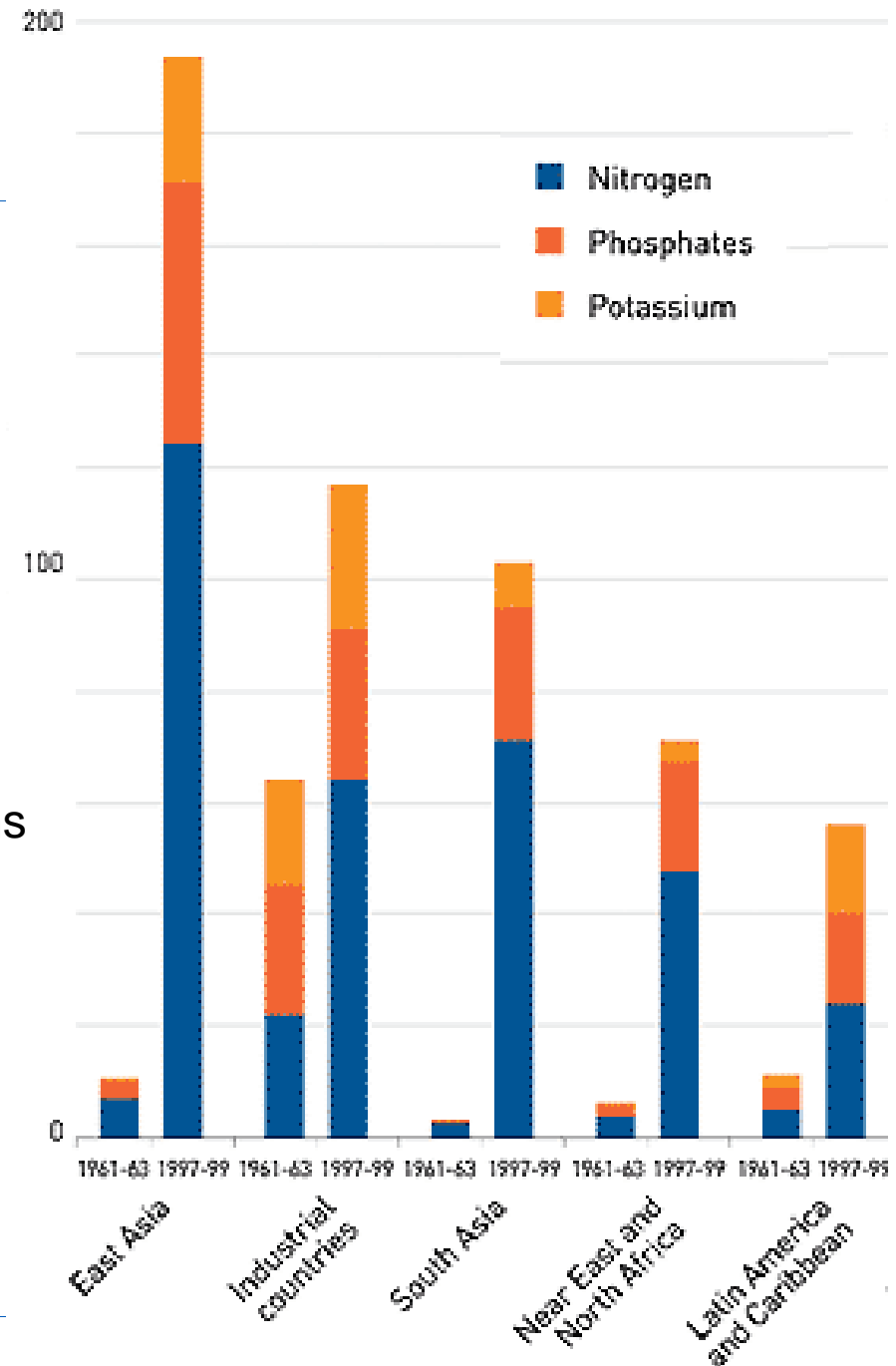
& John Armour, Vellupillai Rasiah, Ninghu Su, Sarah Connor, Chris Crowell, Steven Wakelin

# Background

Why be interested in:

- nutrient movement?

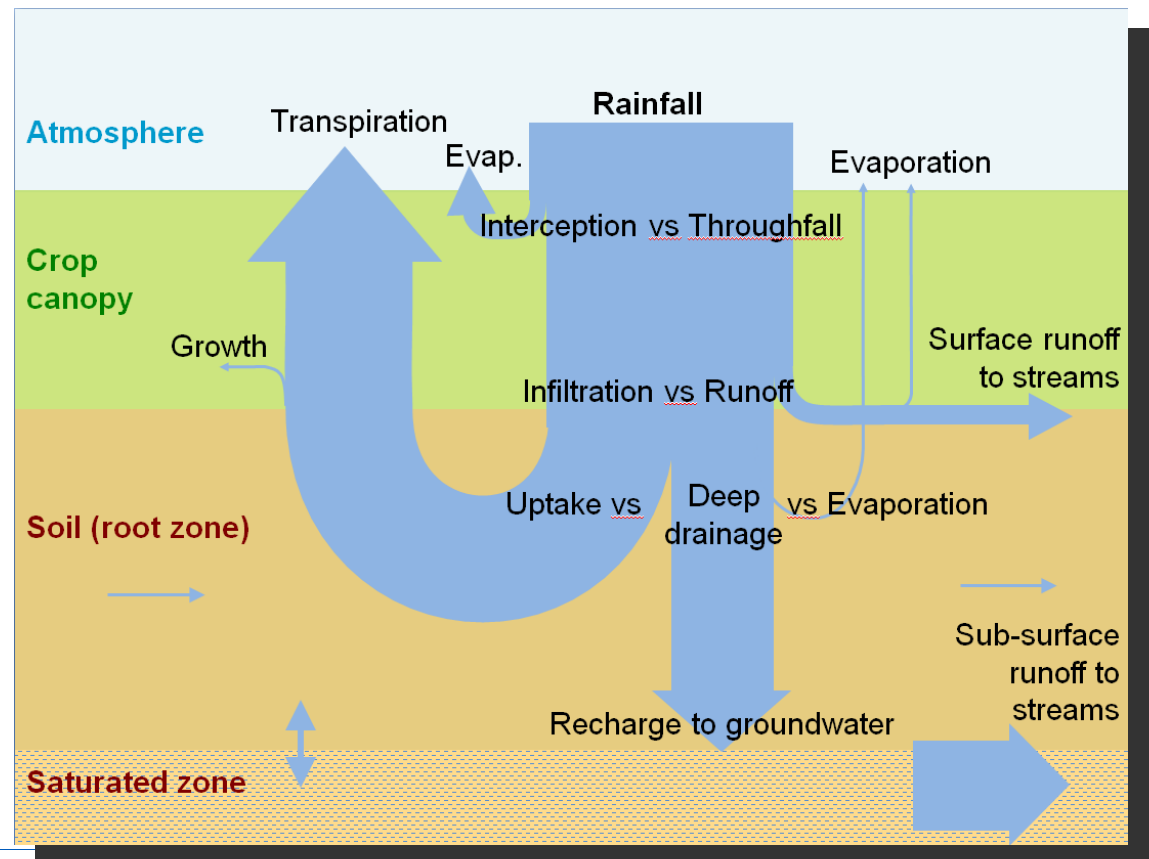
Nutrient  
applications  
(kg/ha)



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- groundwater?



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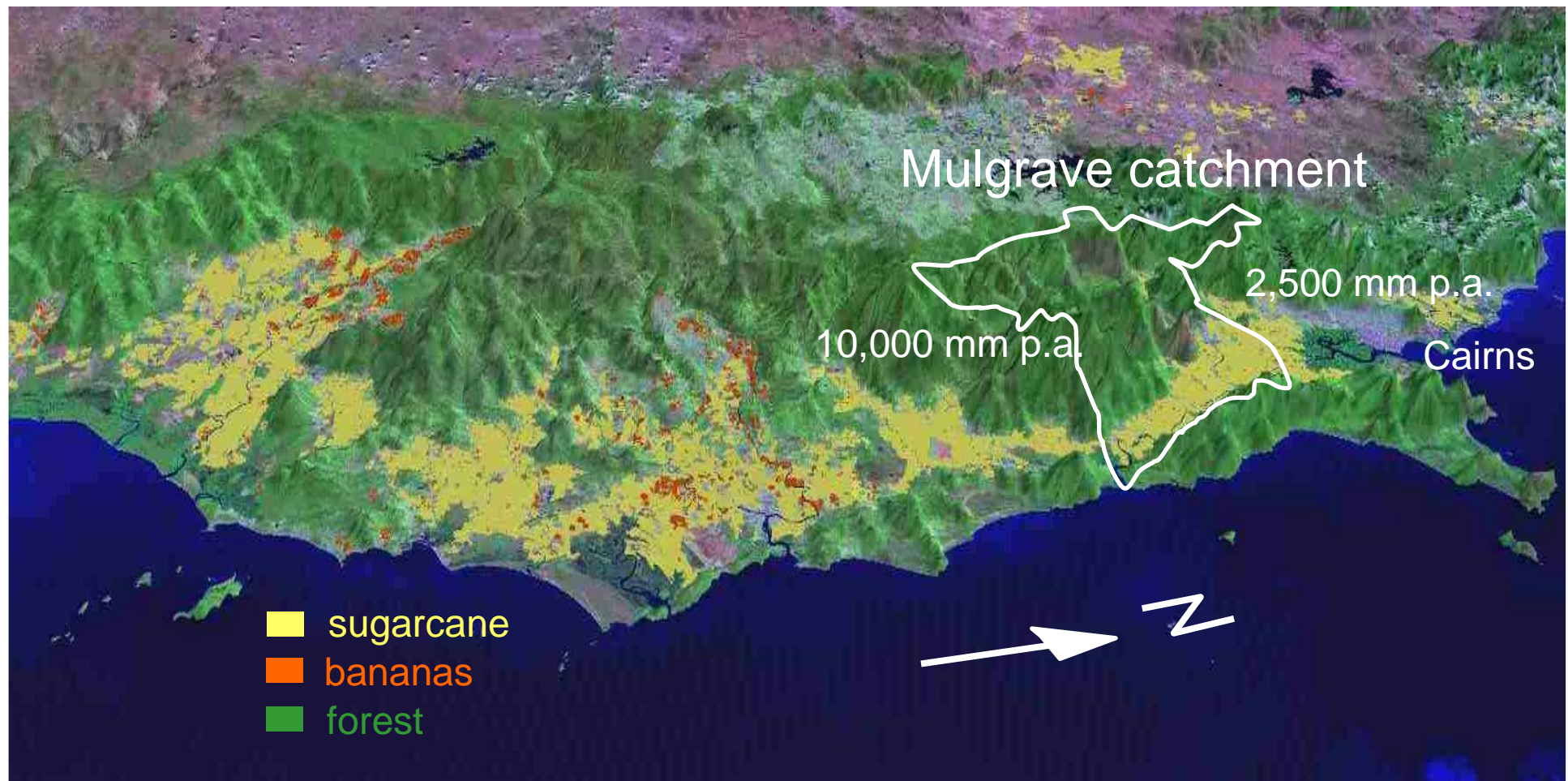
**Climate change effects?**



# 1. Study sites

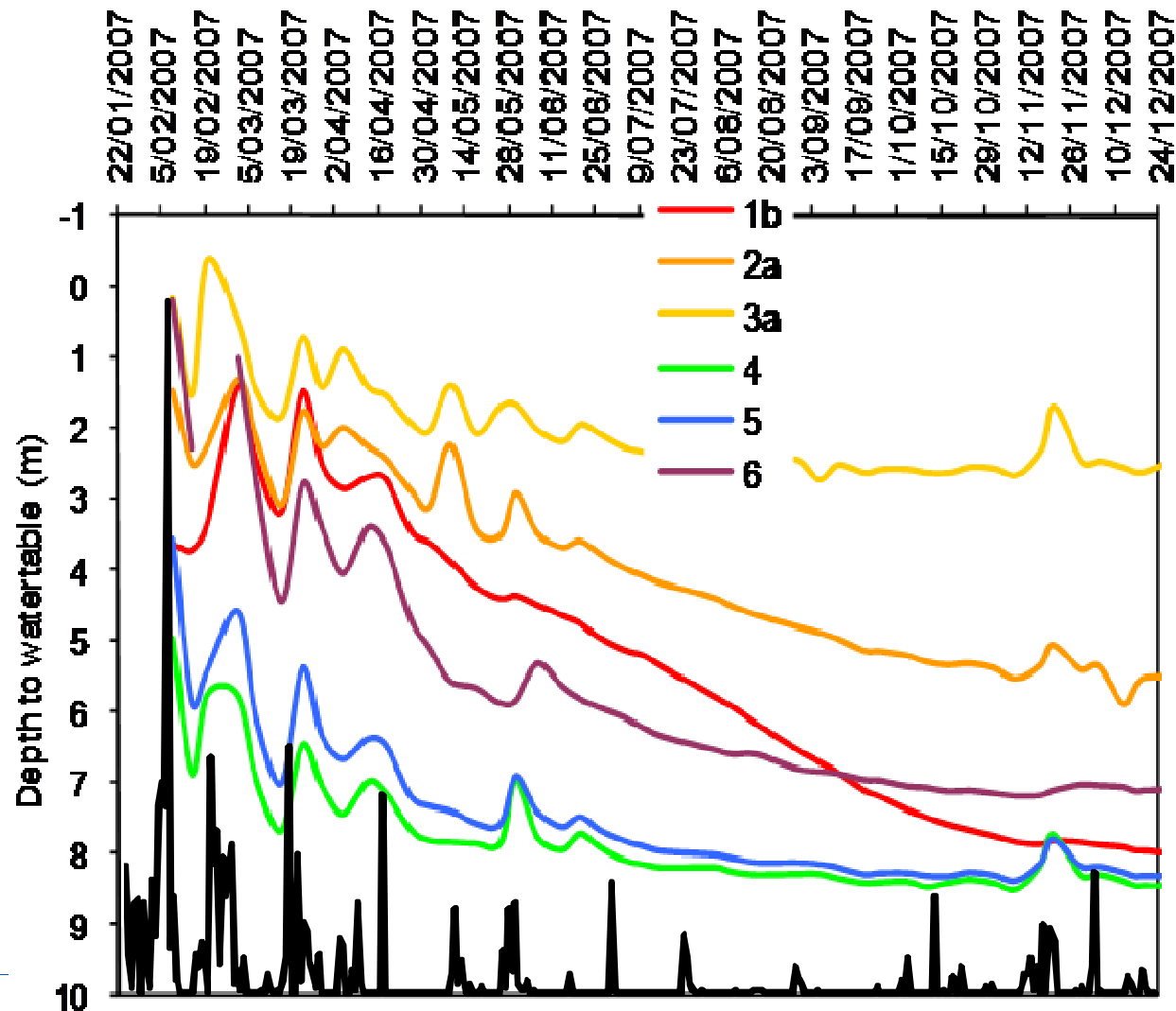
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Indonesia, Papua New Guinea, North Queensland  
Forested mountains and agricultural plains



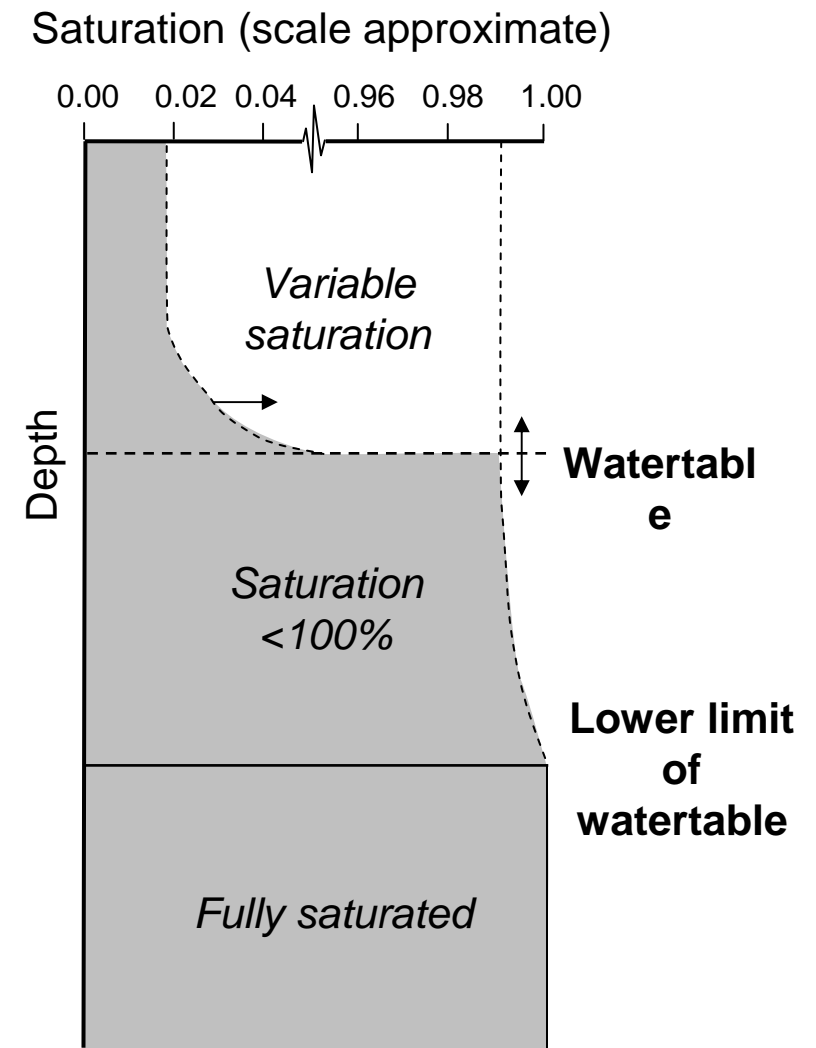
## 2. Physical behaviour of shallow GW systems

Depth to watertable throughout one year

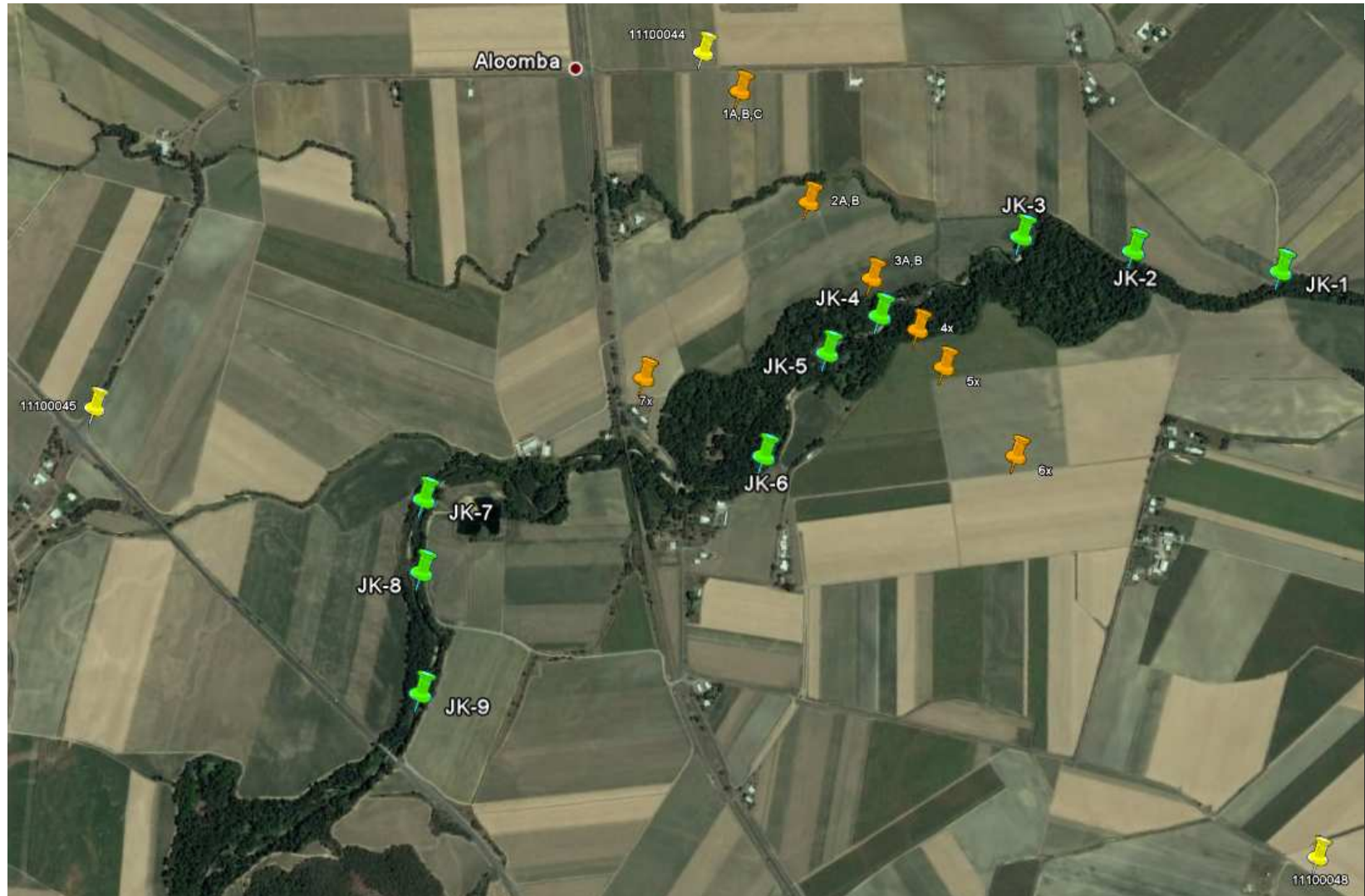




## 2. Physical behaviour of shallow GW systems



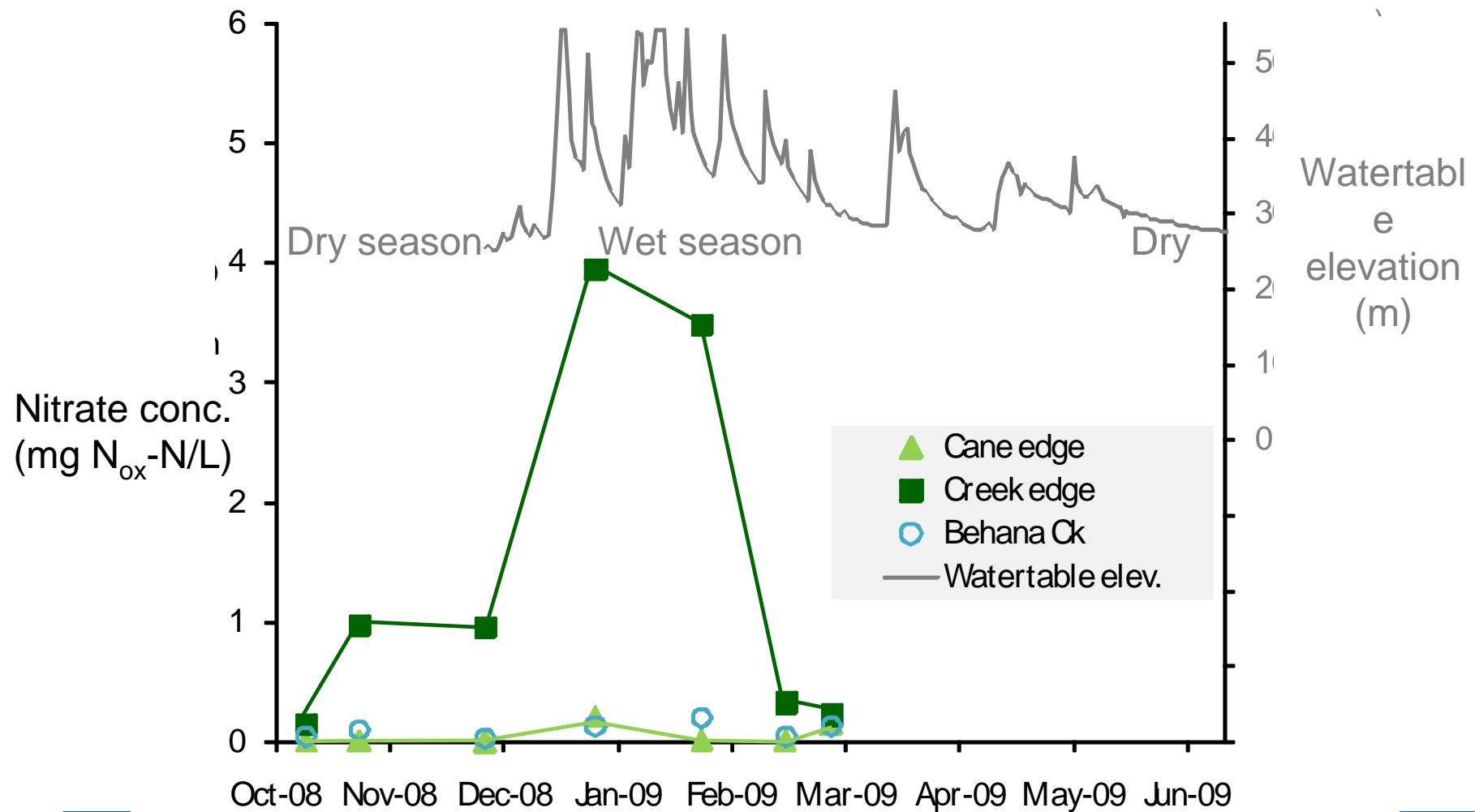
### 3. Riparian zone processes





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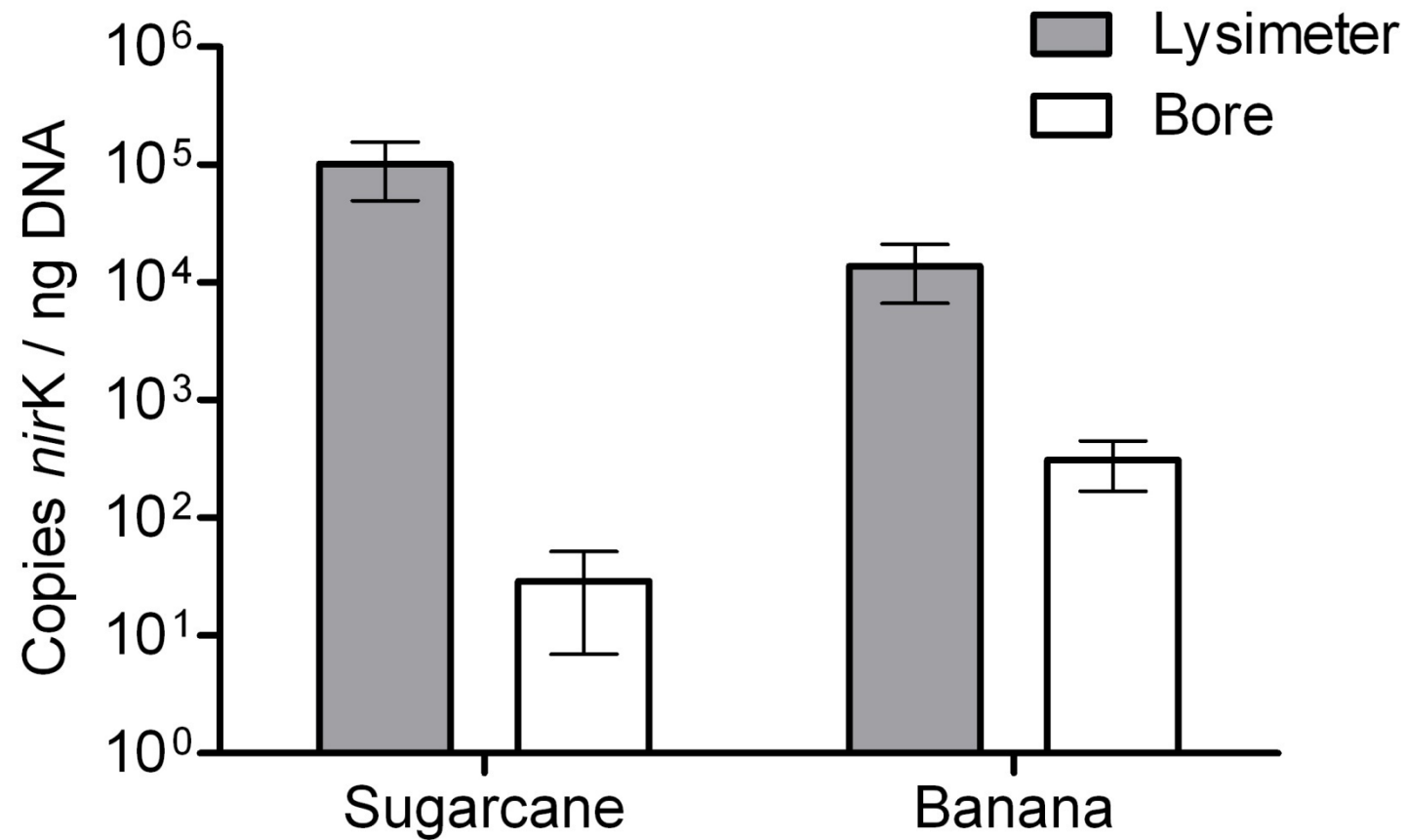
Concentration of nitrate in groundwater moving through riparian forest



## 4. Microbiological drivers

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Denitrifier microbial communities



# Conclusions

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- Integration of diverse approaches helping us understand these dynamic systems
    1. Rapid movement of groundwater leads to widespread aerobic conditions
    2. Riparian not effective water purifier as it is in temperate regions
    3. Diverse, unique and unknown microbial communities driving processes
  - Climate change: even less predictable?
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