What's going on down (under) there? Unravelling biochemical flows under differential rainfall periods in a Western Australian calcrete

Mattia Saccò, Alison Blyth, Karina Meredith, Colin Smith, Quan Hua, Debashish Mazumder, William F. Humphreys, Nicole White, Kliti Grice

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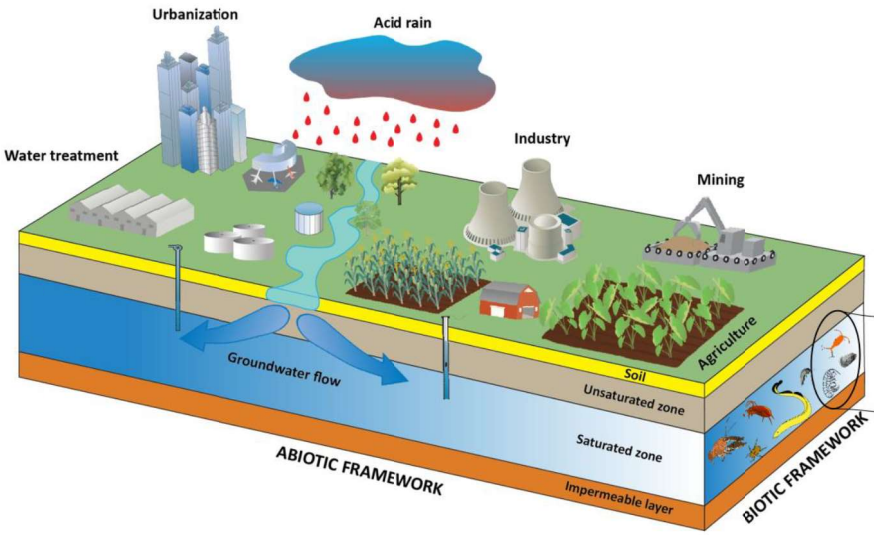
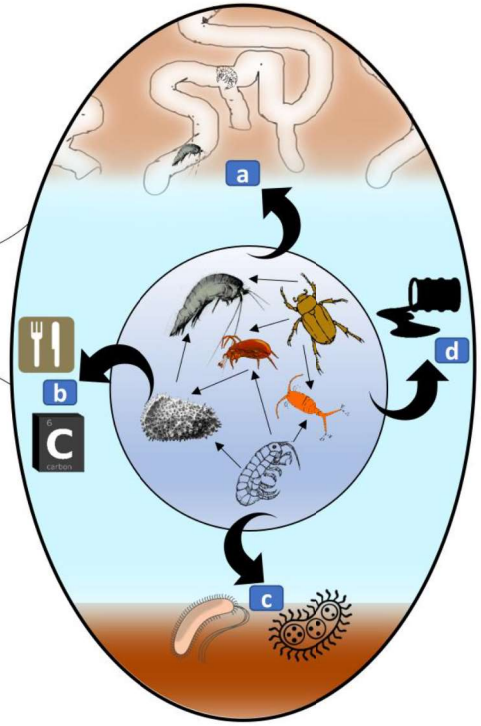
Background

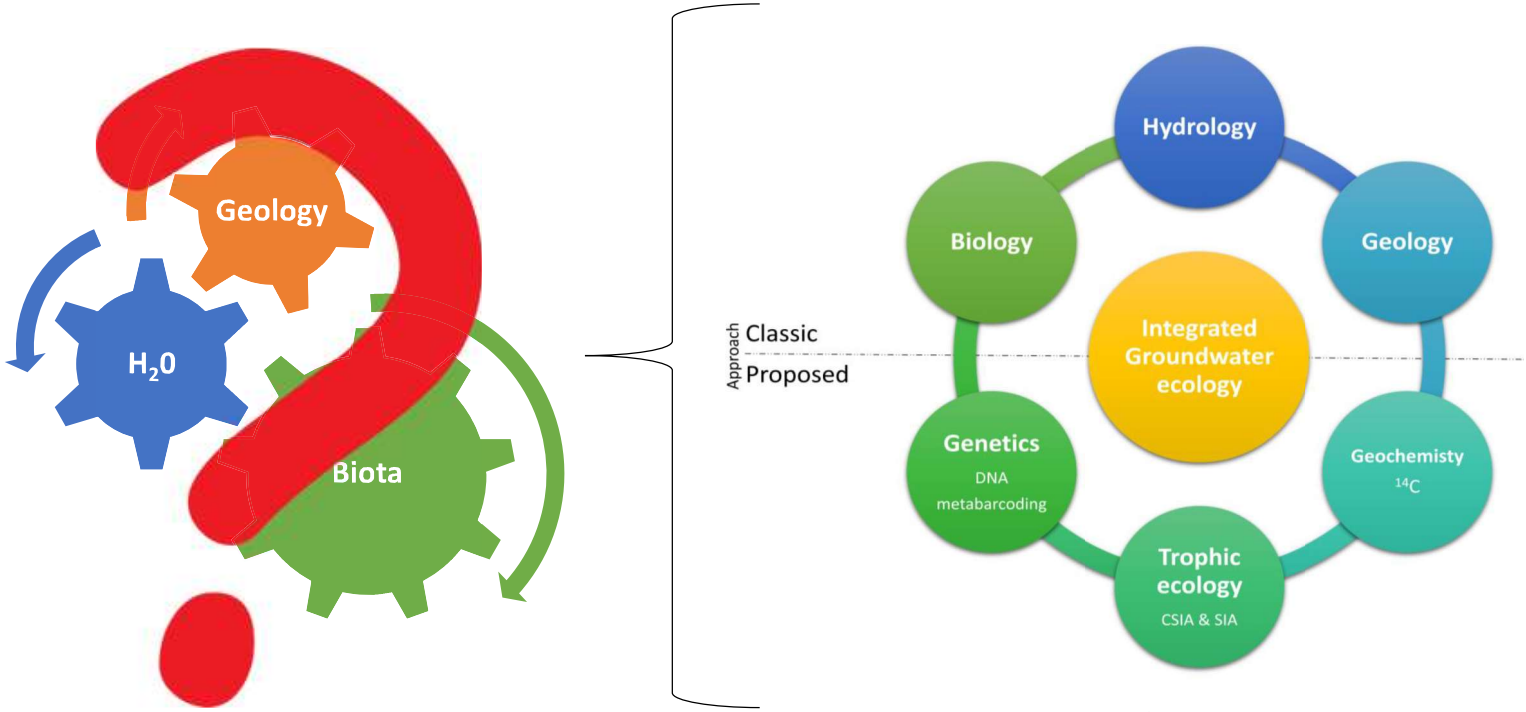




a) Burrowing/bioturbating
b) Water purification
c) Biofilm proliferation
d) Water depuration

Saccò *et al*., 2019a

Trying to fill the void



Saccò *et al.*, 2019a

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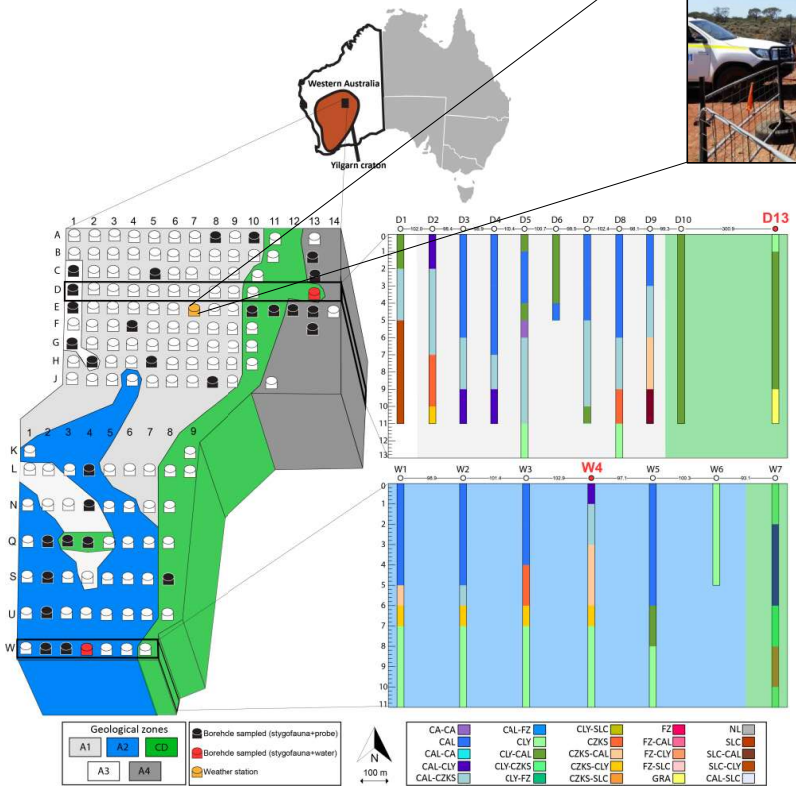
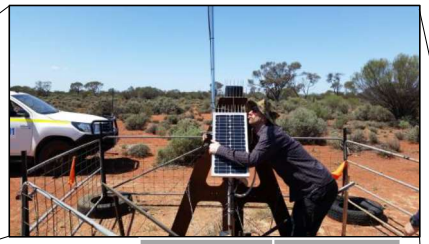
Study area…

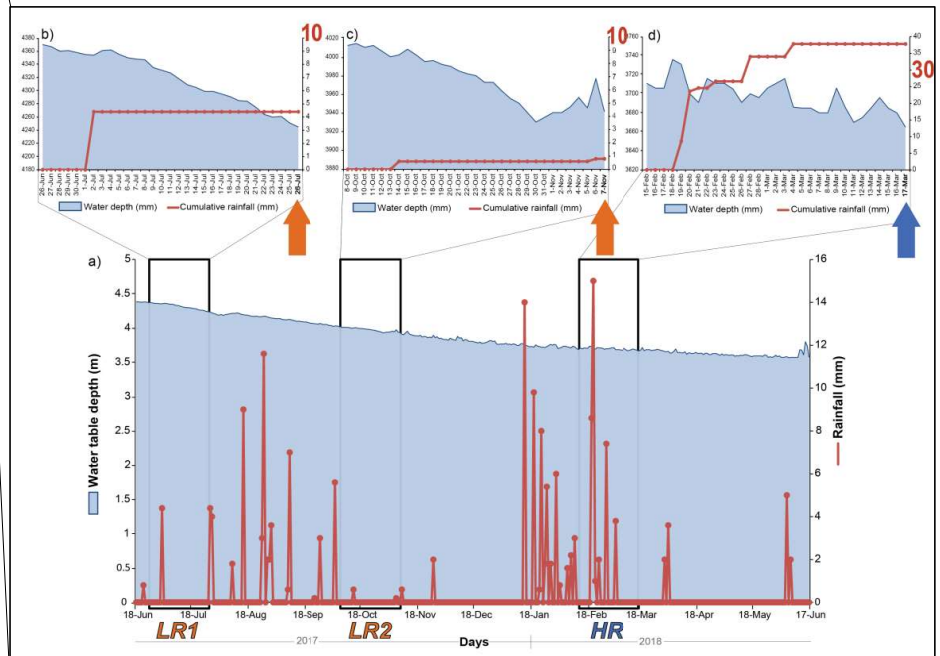




Rainfall period	Rainfall mm (30 days)
Low (LR)	<10
Int. (IR)	10 - 30
High (HR)	>30

Hyde *et al*., 2018

…and sampling design



Saccò *et al*., 2019b

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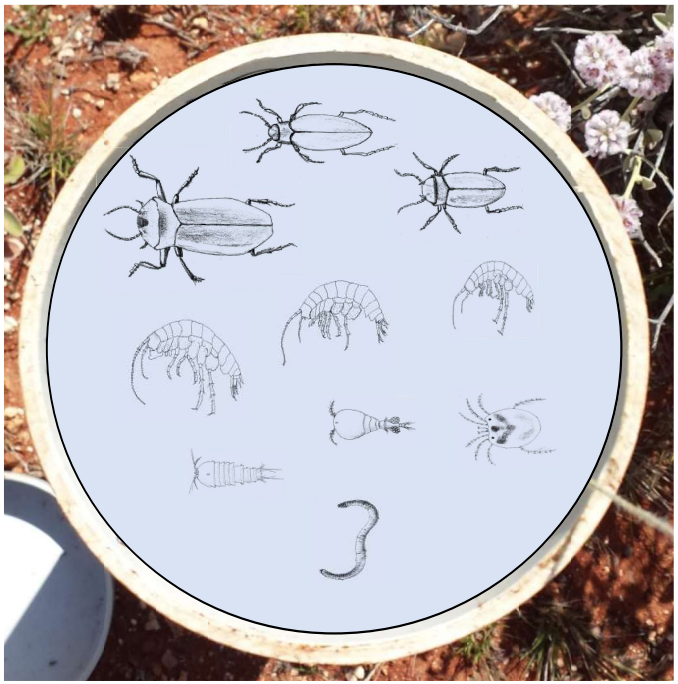
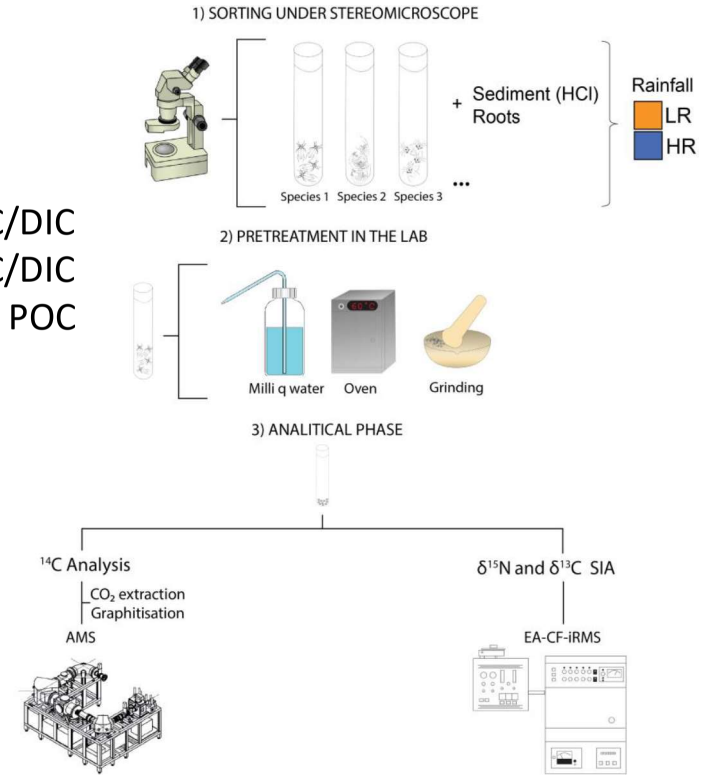
Samples collection…



… and analytical procedure

+
13C DOC/DIC
14C DOC/DIC
13C/14C POC



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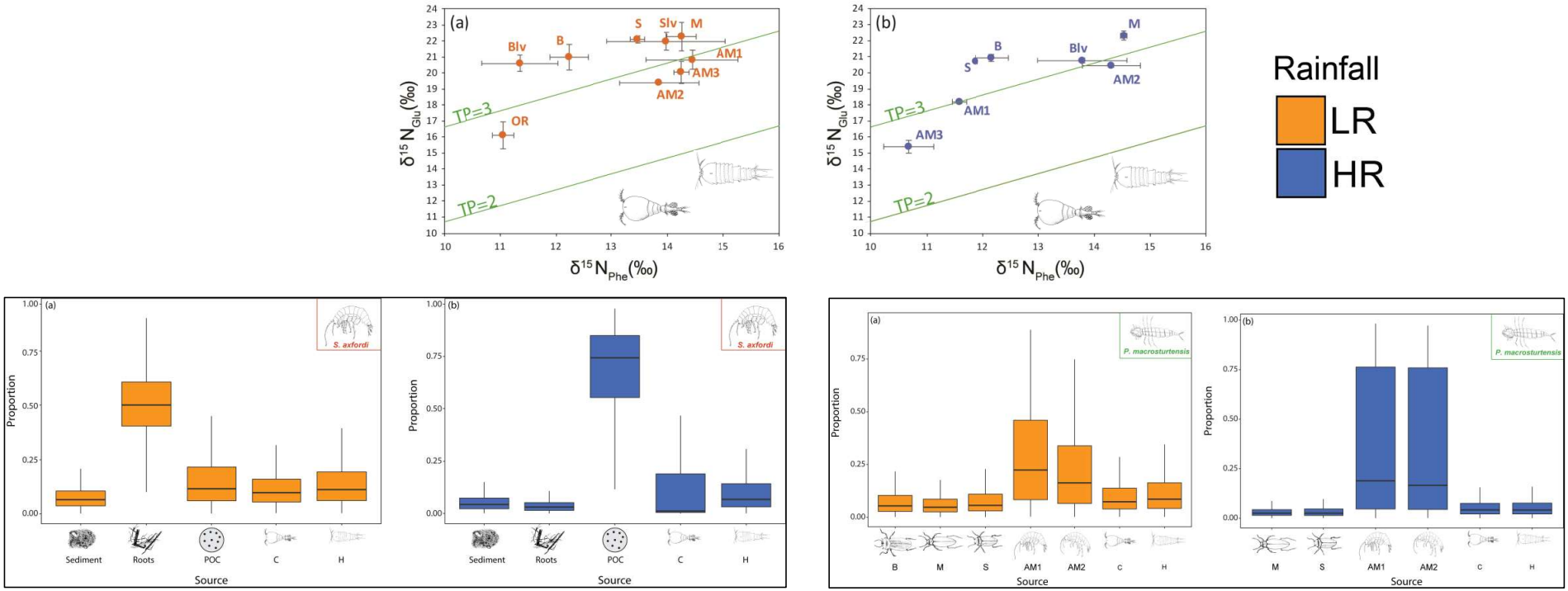
Ecological dynamics



Saccò *et al.*, 2019c

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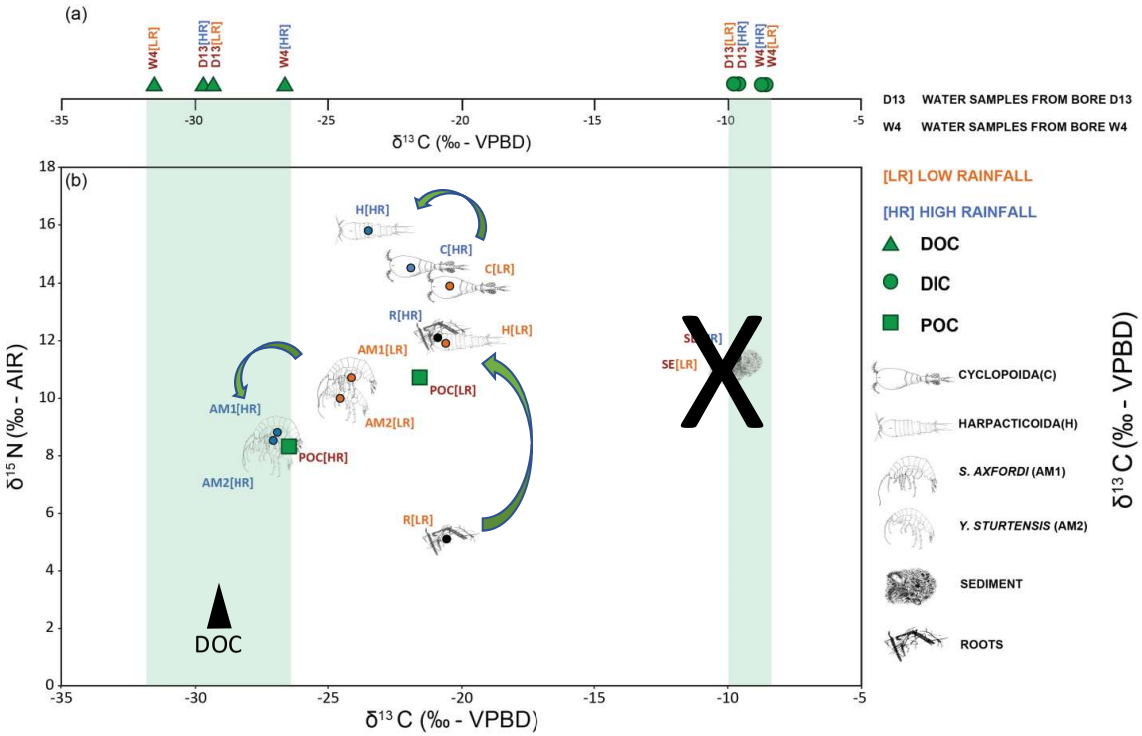
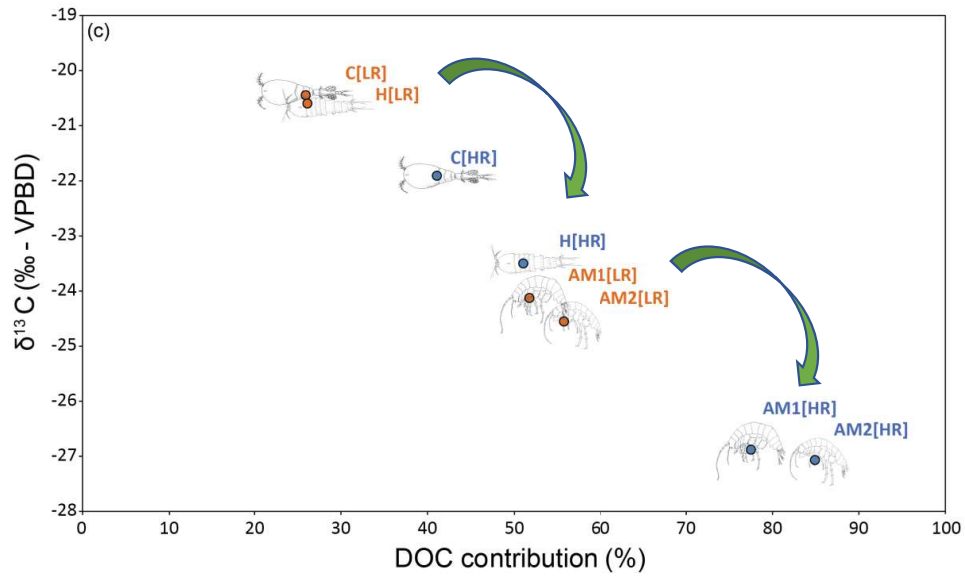
Stygofaunal organic inputs





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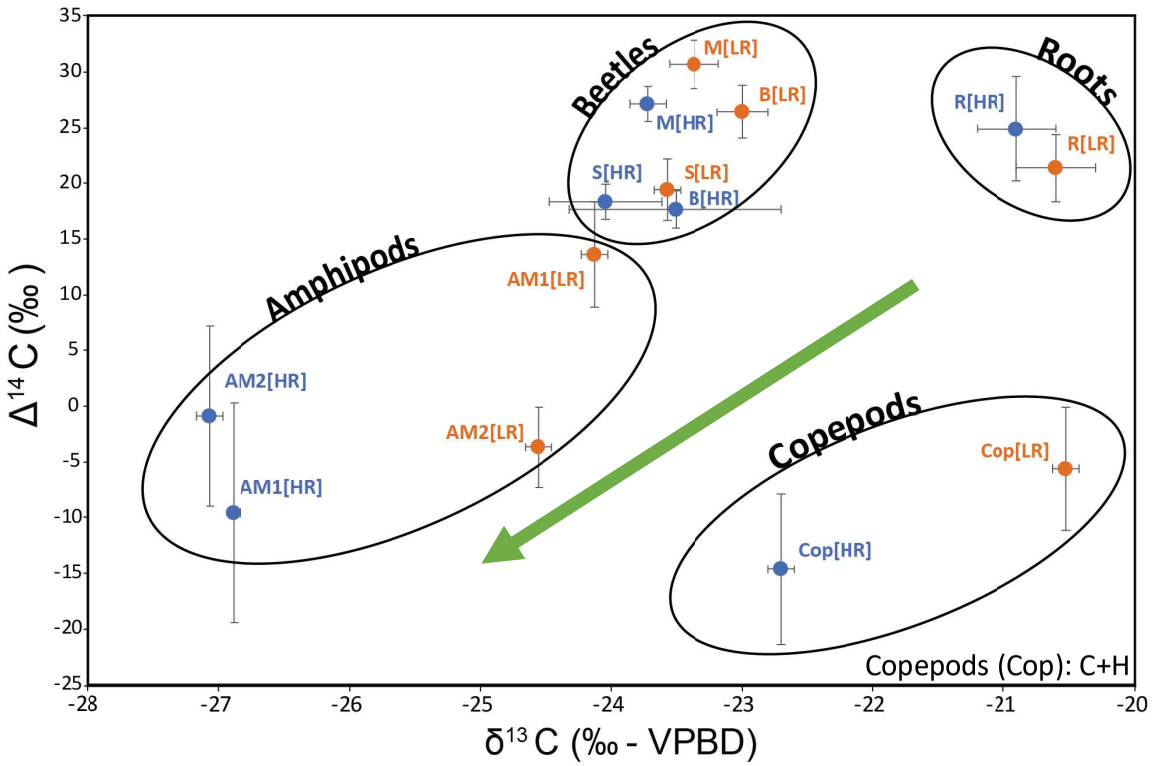
Stygofaunal carbon transfers



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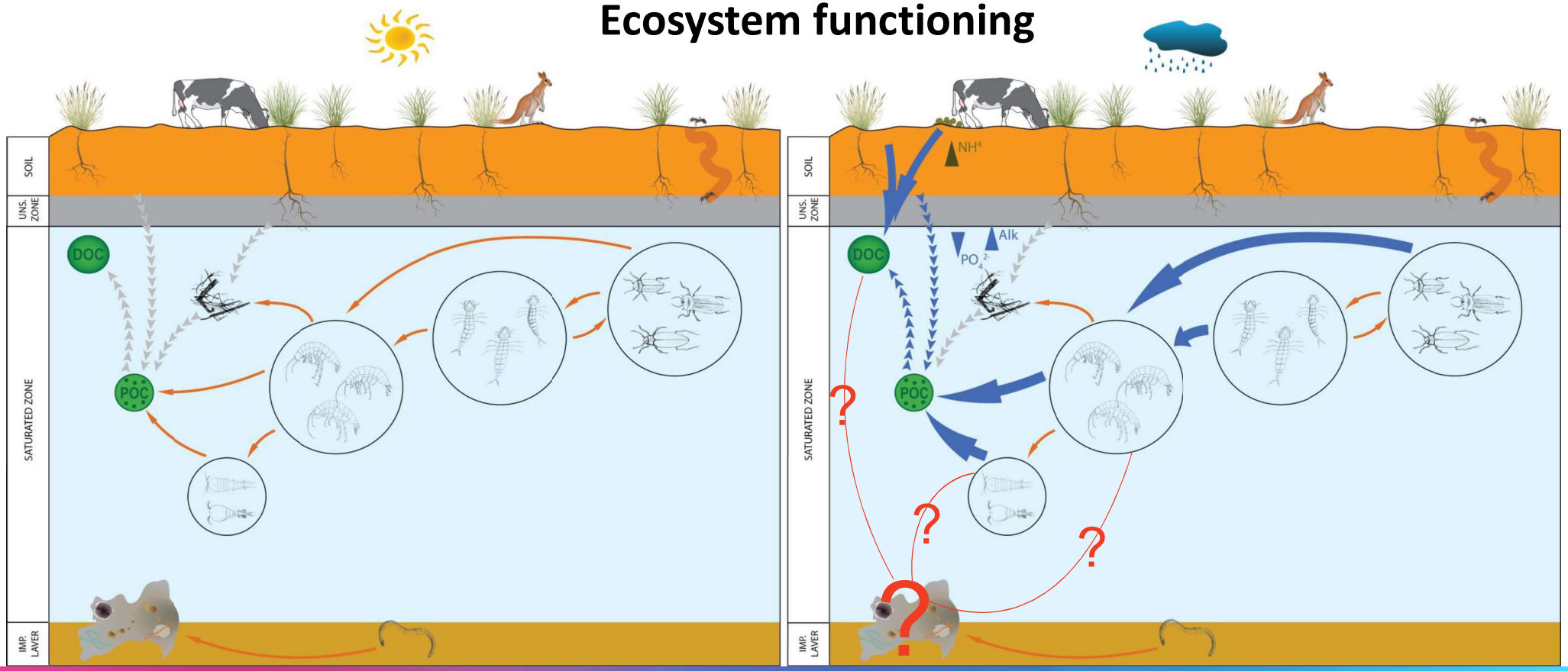
Ecosystem functioning



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Conclusions

- Stygofaunal trophic interactions are stable, typical of an ecologically tolerant community
- Inflow of nutrients causes shift in amphipods' OM inputs and dietaries of beetles larvae (increased predatory pressures on amphipods)
- Secondary consumers amphipods, together with copepods, increased their (microbially derived?) DOC incorporations after rainfall
- Trophic niche partitioning is a plausible ecological driver in the system
- Microbes mediate abiotic/biotic transitions?

More in the next episode…

Thanks

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