

Nitrogen movement through the braidplain

Naomi Wells

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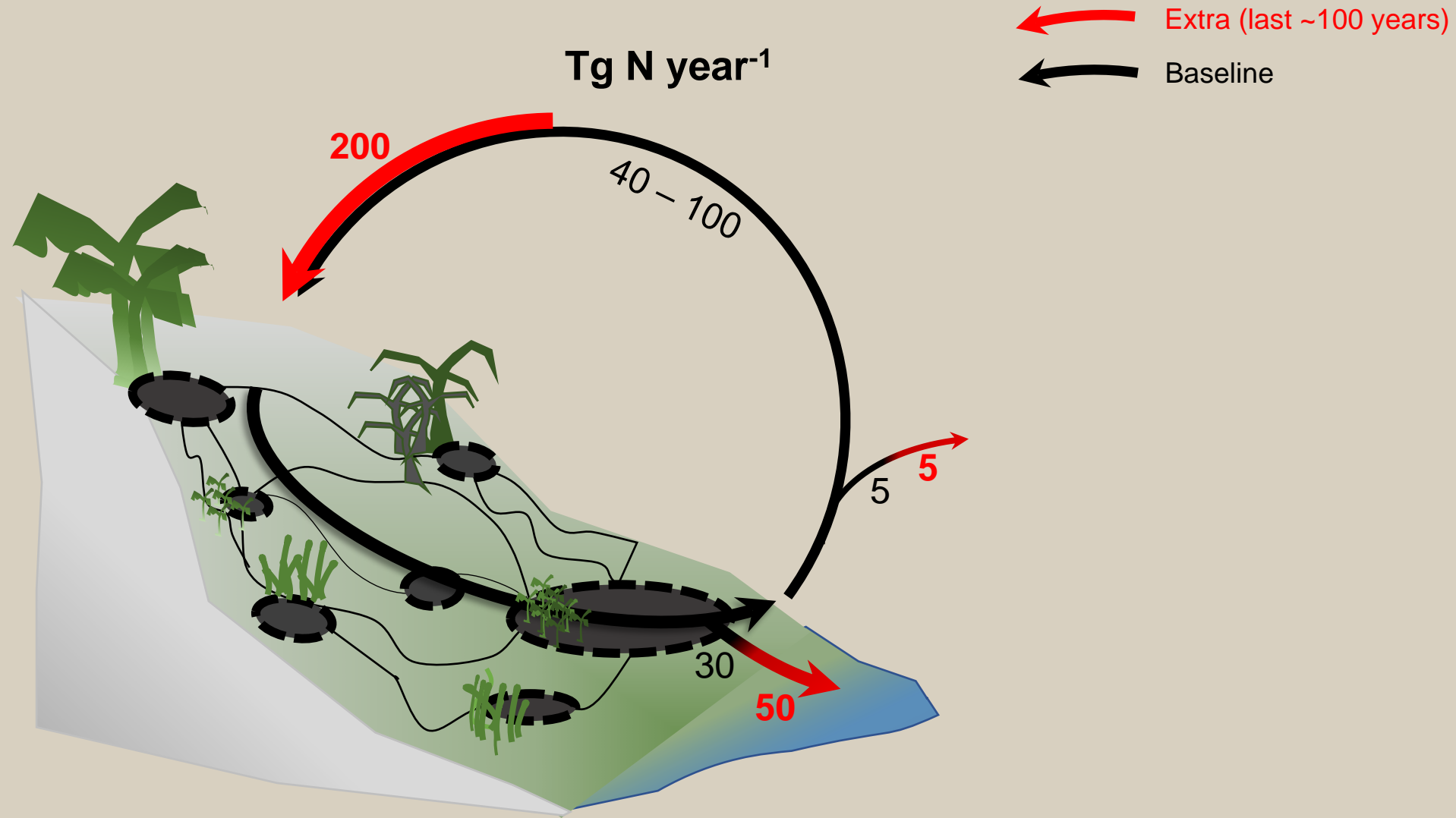
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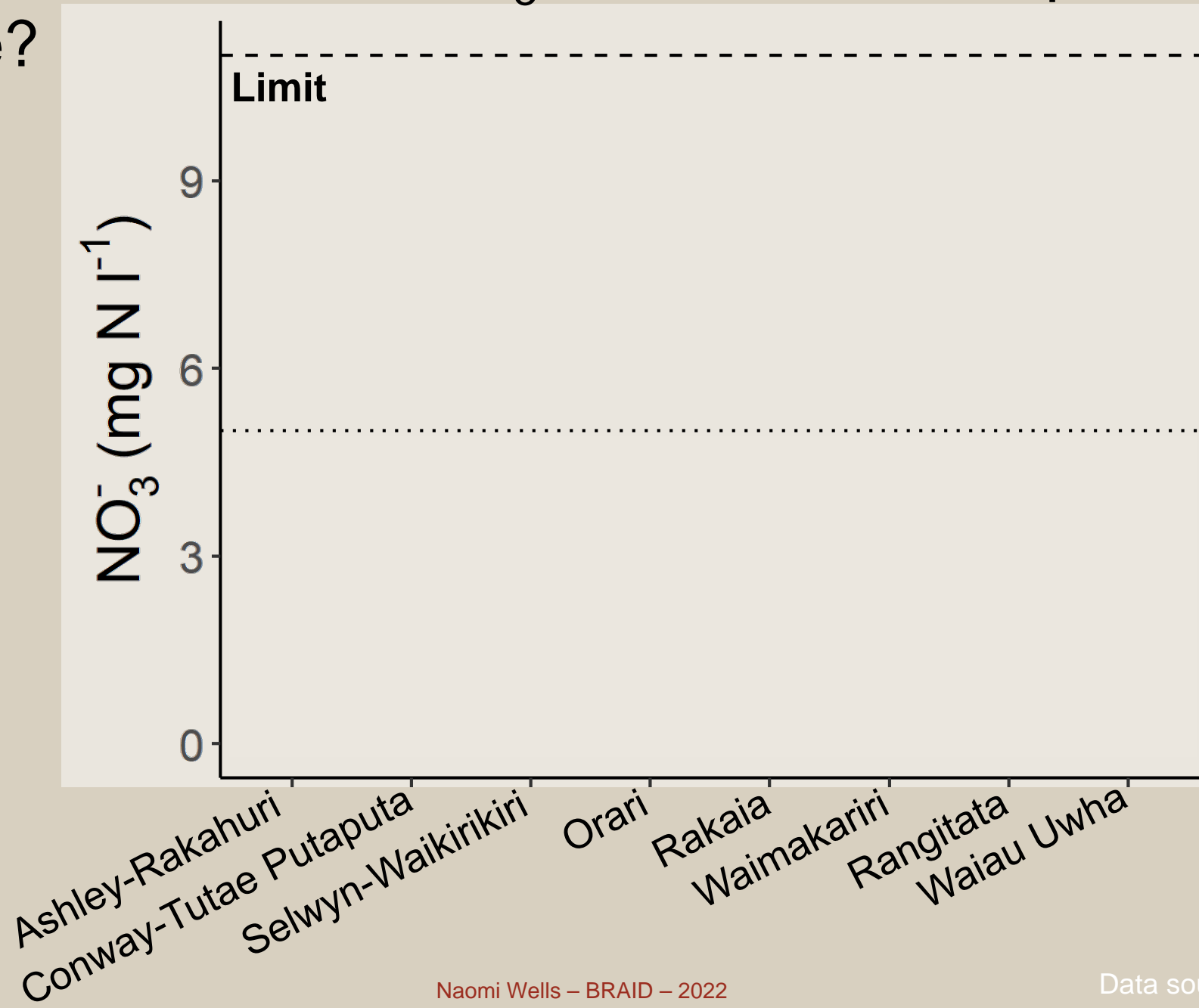
 **@15nswells**

Photo: ORC

Why nitrogen movement through rivers matters?

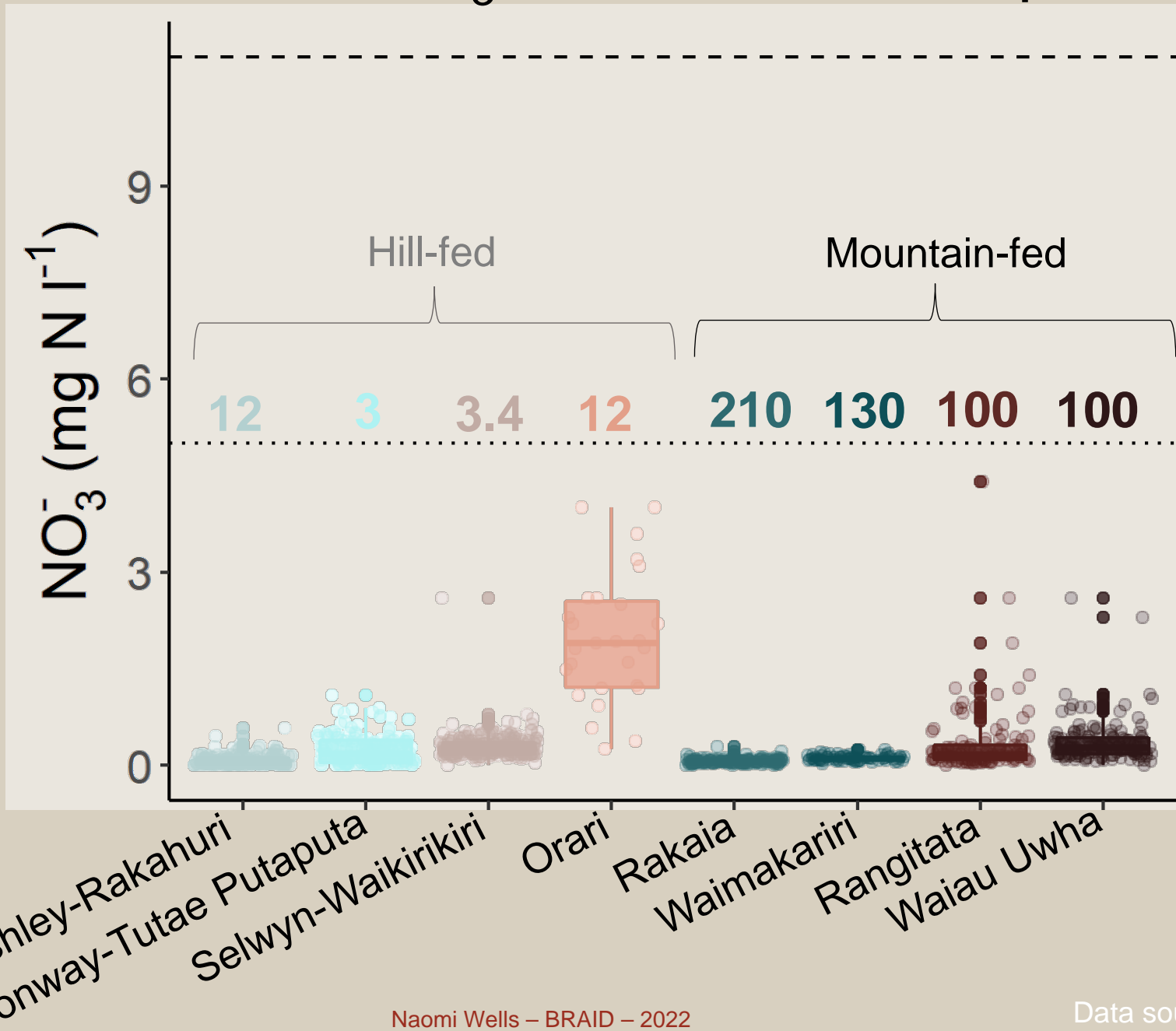


Does the concentration of NO_3^- in braided rivers pose a threat to (human) life?



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Dilution! (?)

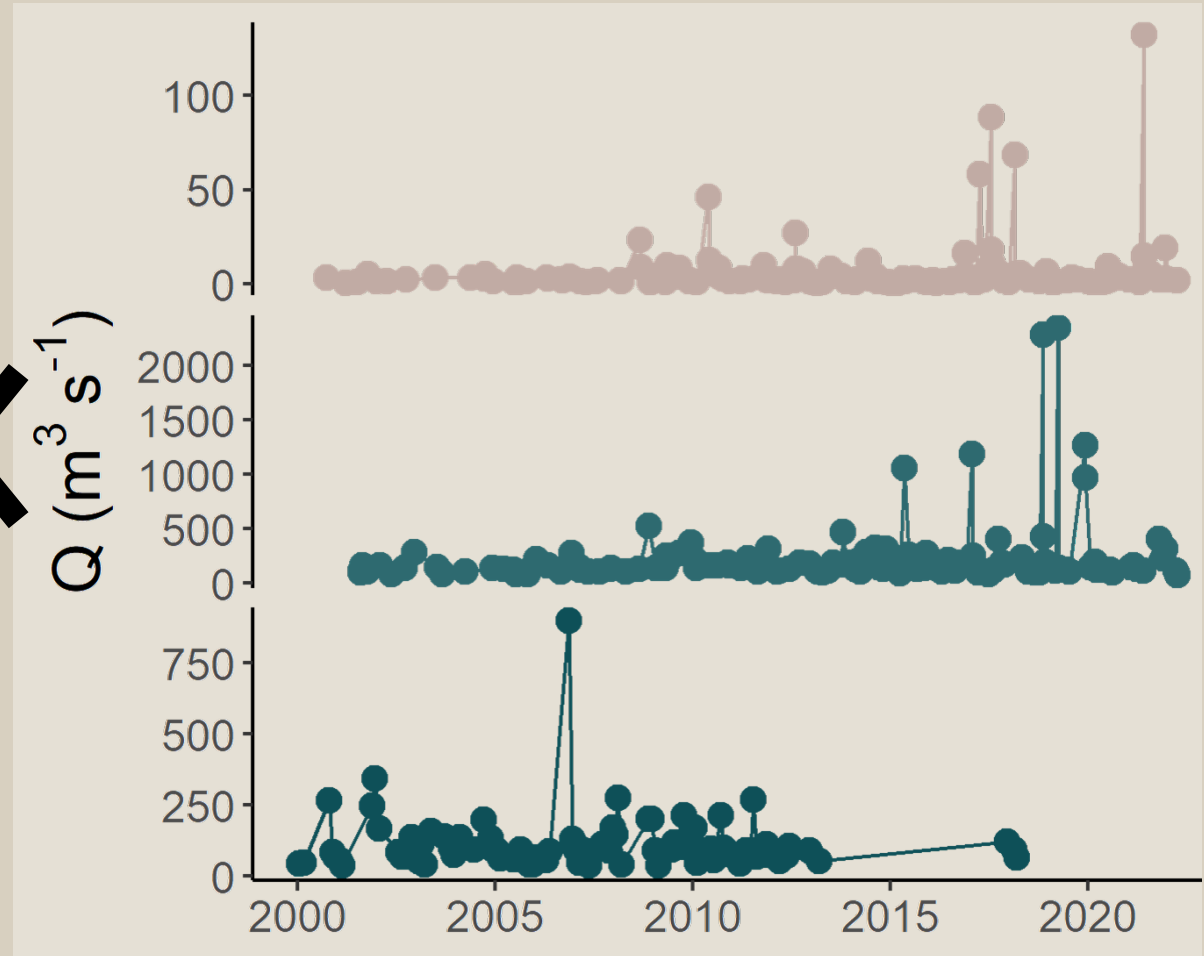


Discharge (Q), $\text{m}^3 \text{s}^{-1}$

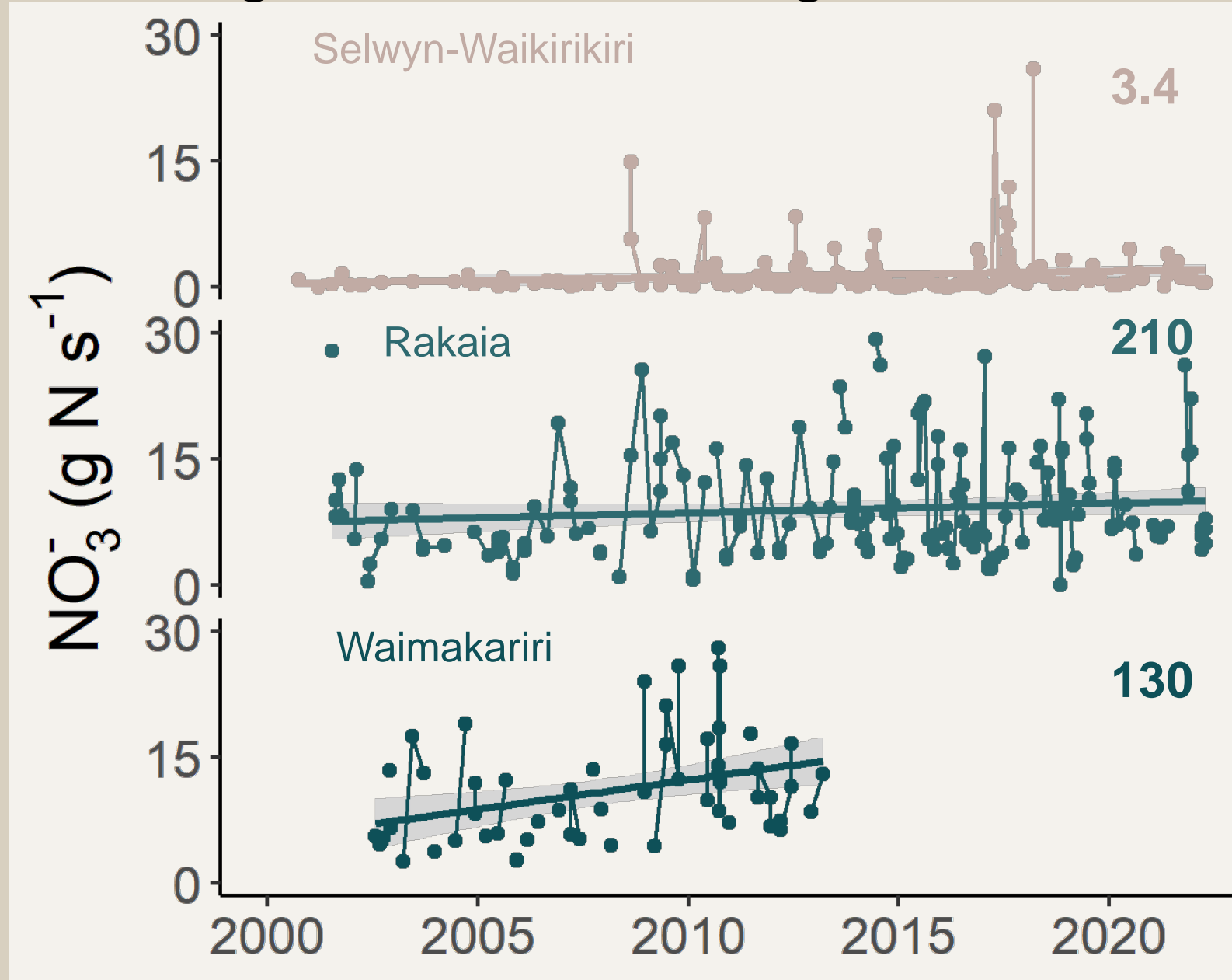
How much nitrogen *moves through* our braided rivers?



X



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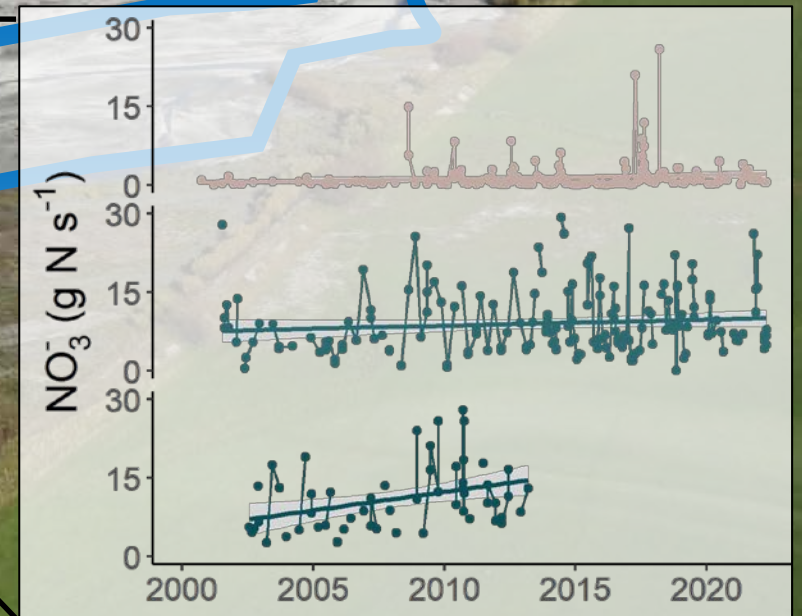
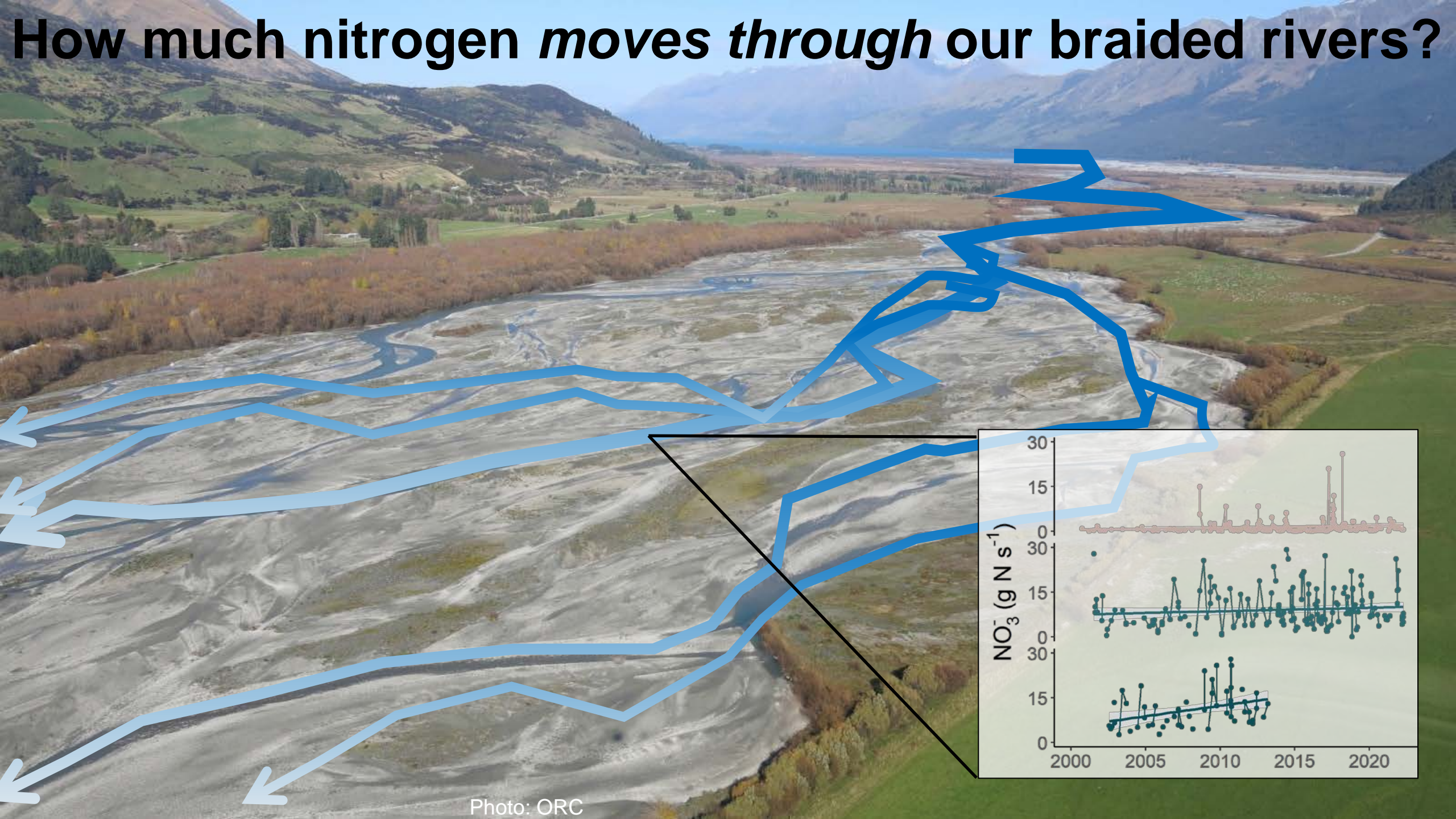
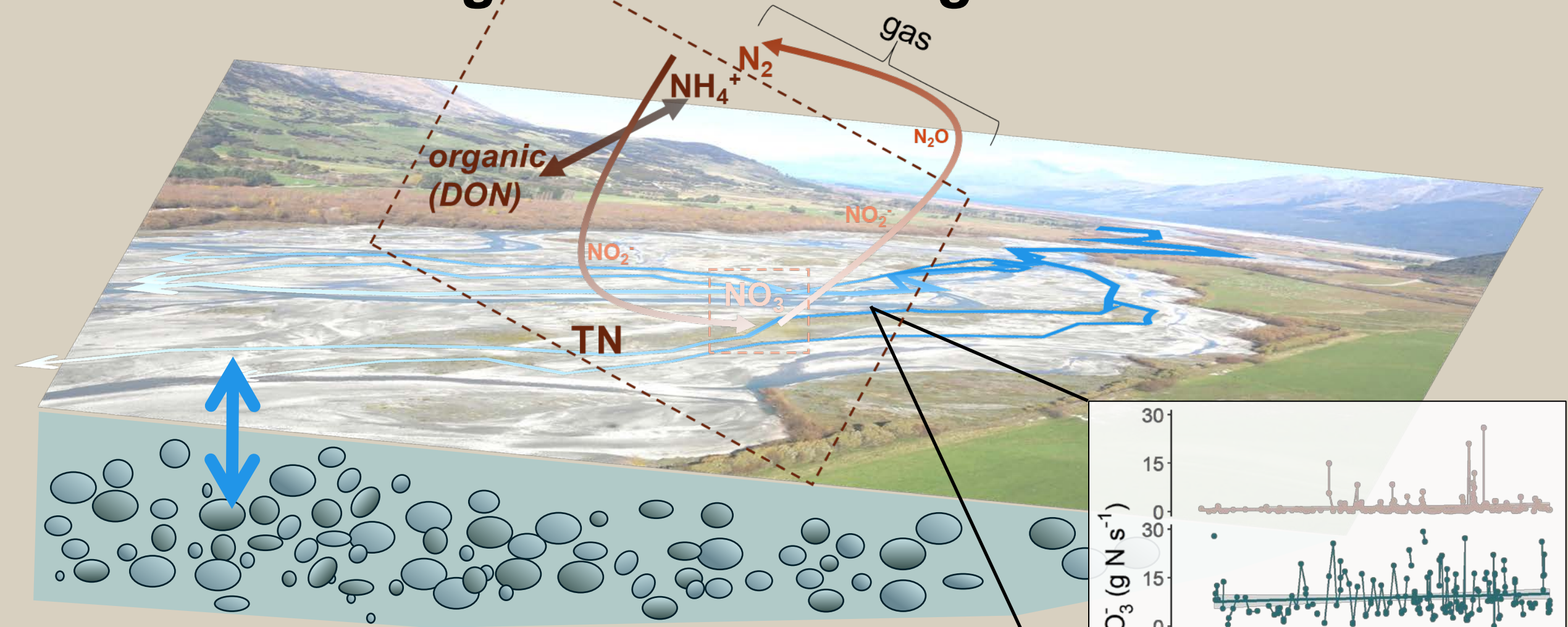


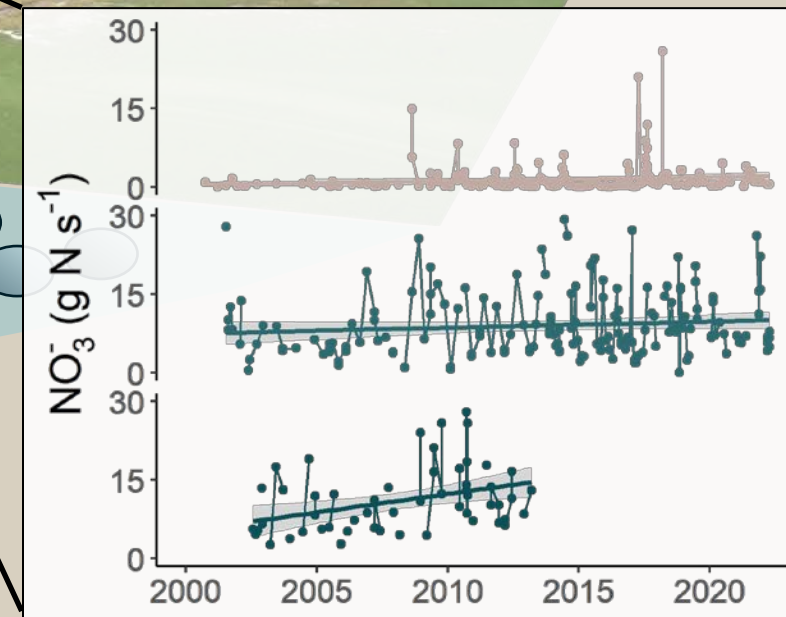
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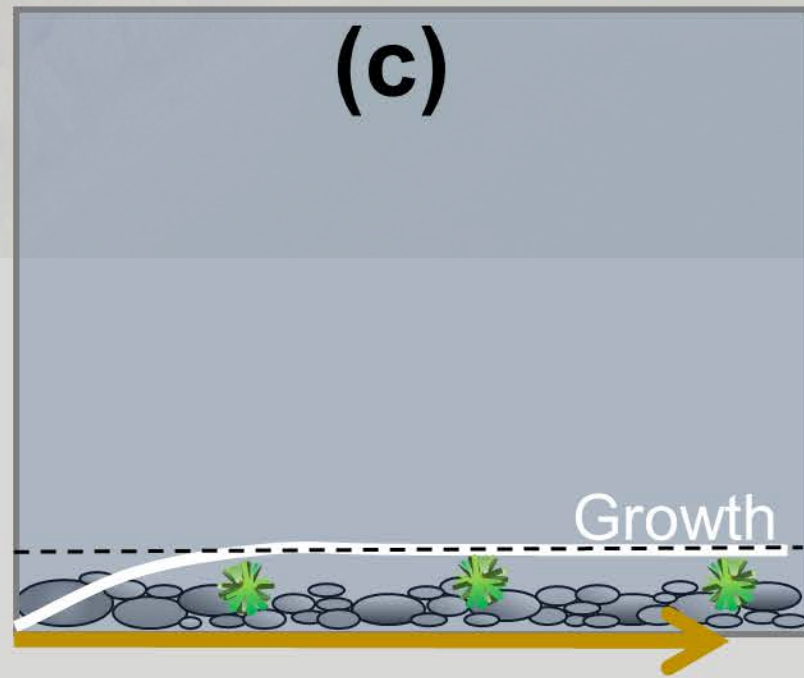
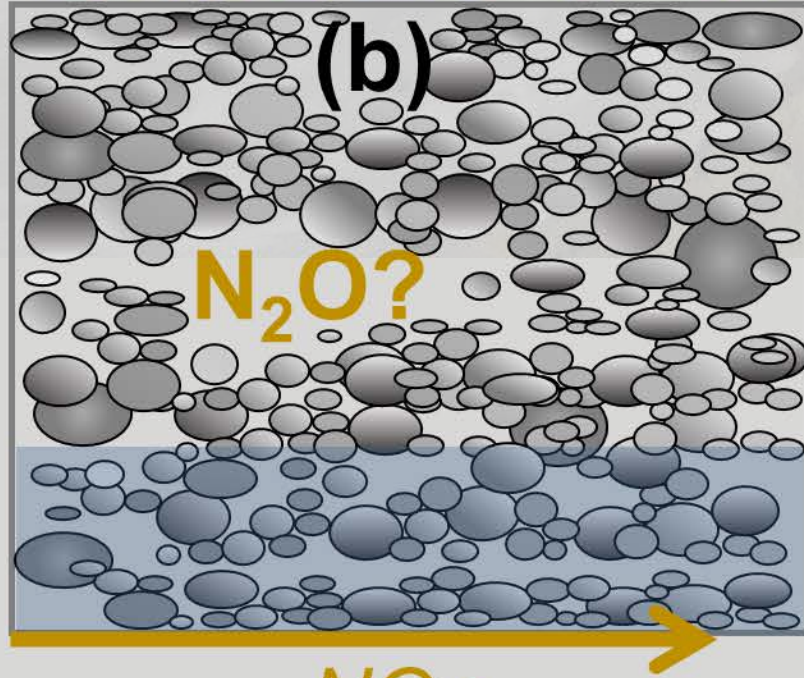
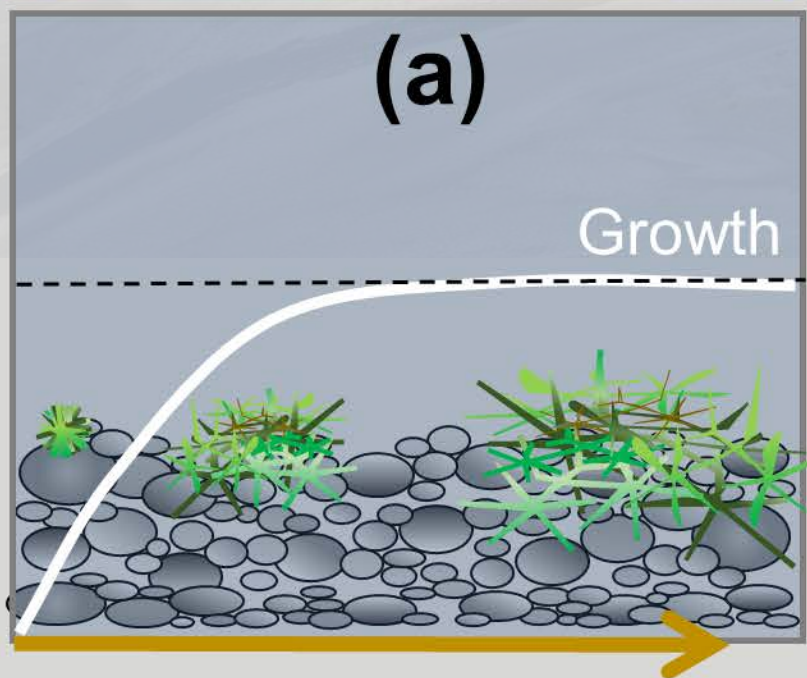
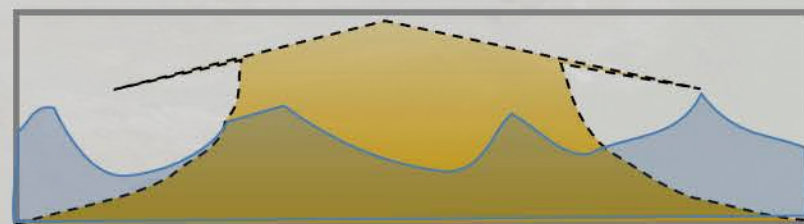
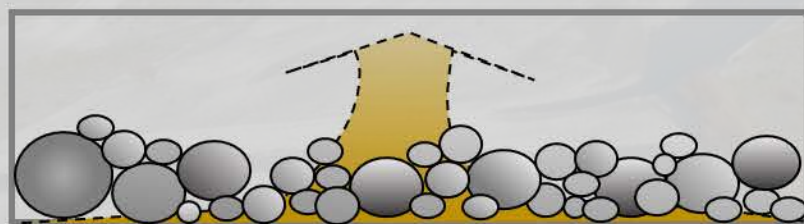
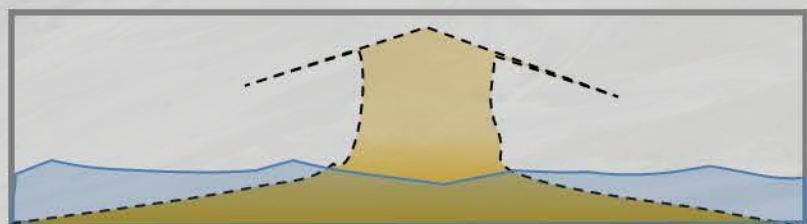
How much nitrogen *moves through* our braided rivers?



Nitrogen transformations controlled by:

- Temperature
- Time
- Carbon

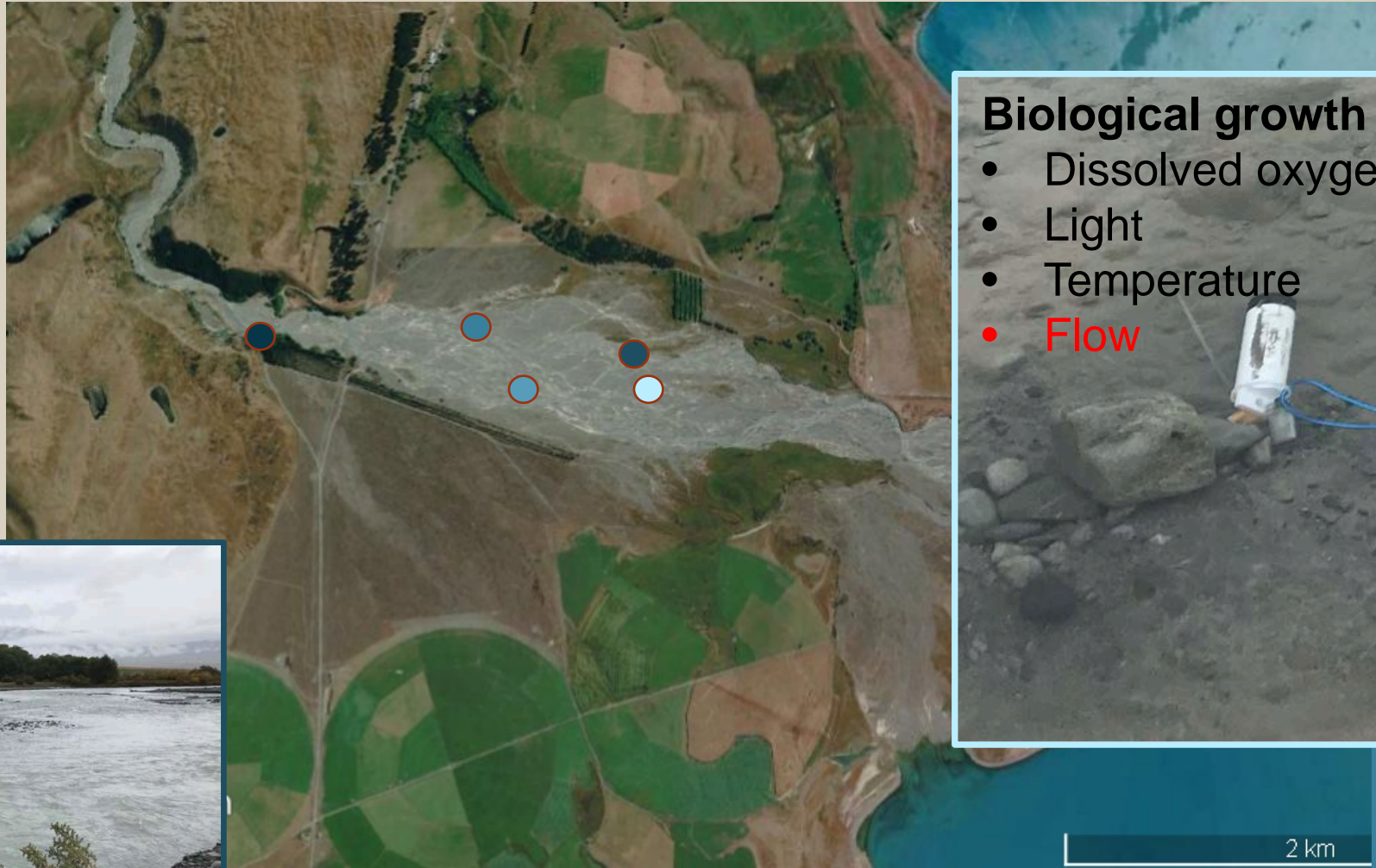




NO_3^-

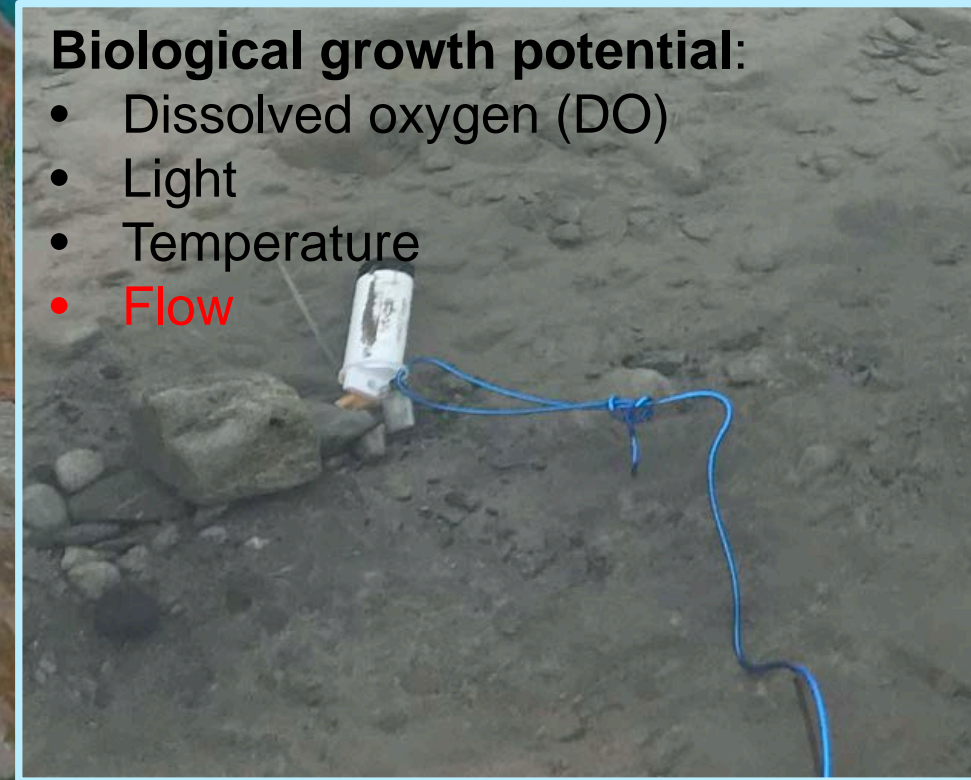
How much nitrogen is consumed, emitted, retained, and/or discharged across different parts of the braid plain?

Holly Harris (UC)

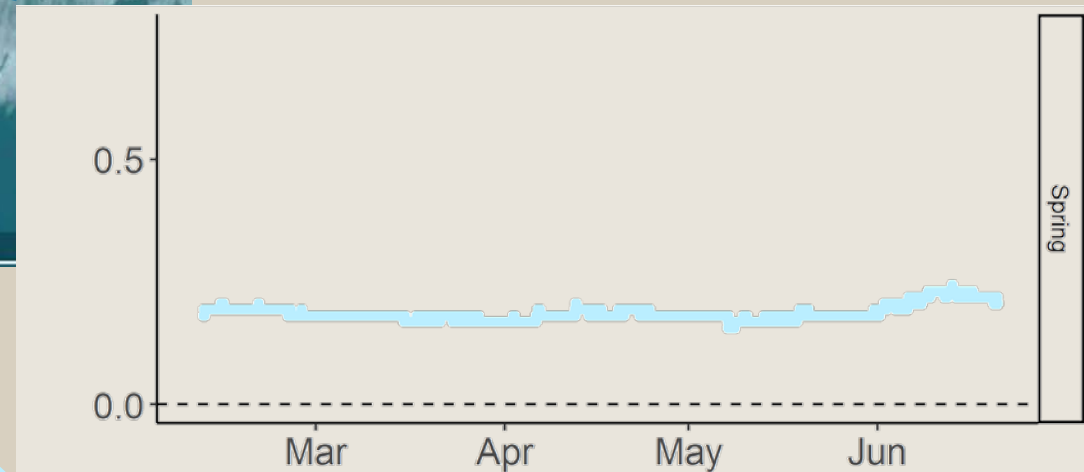
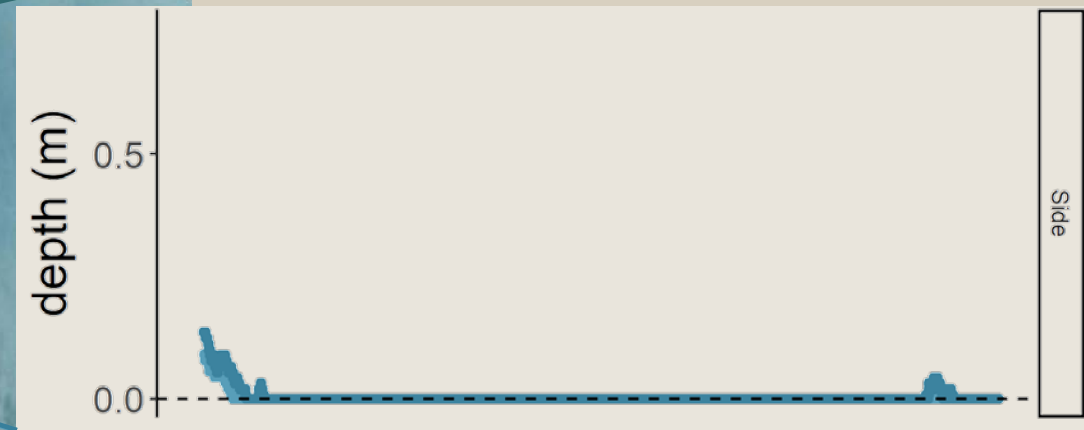
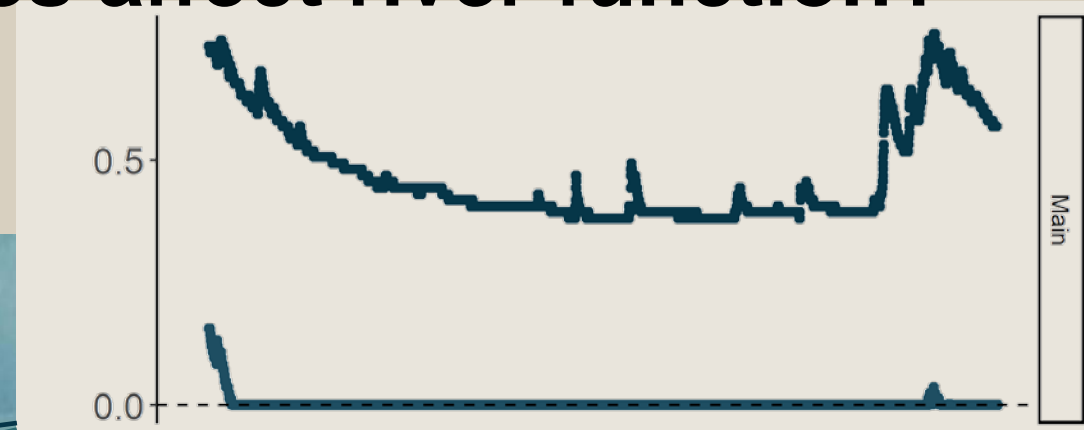


Biological growth potential:

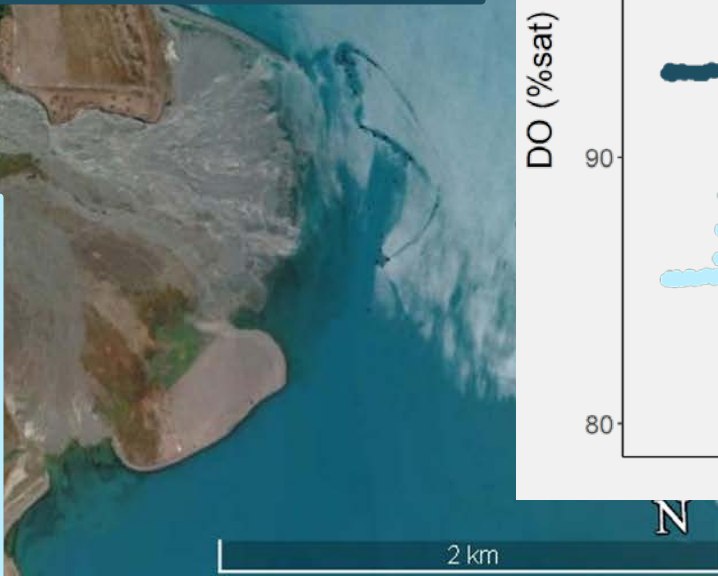
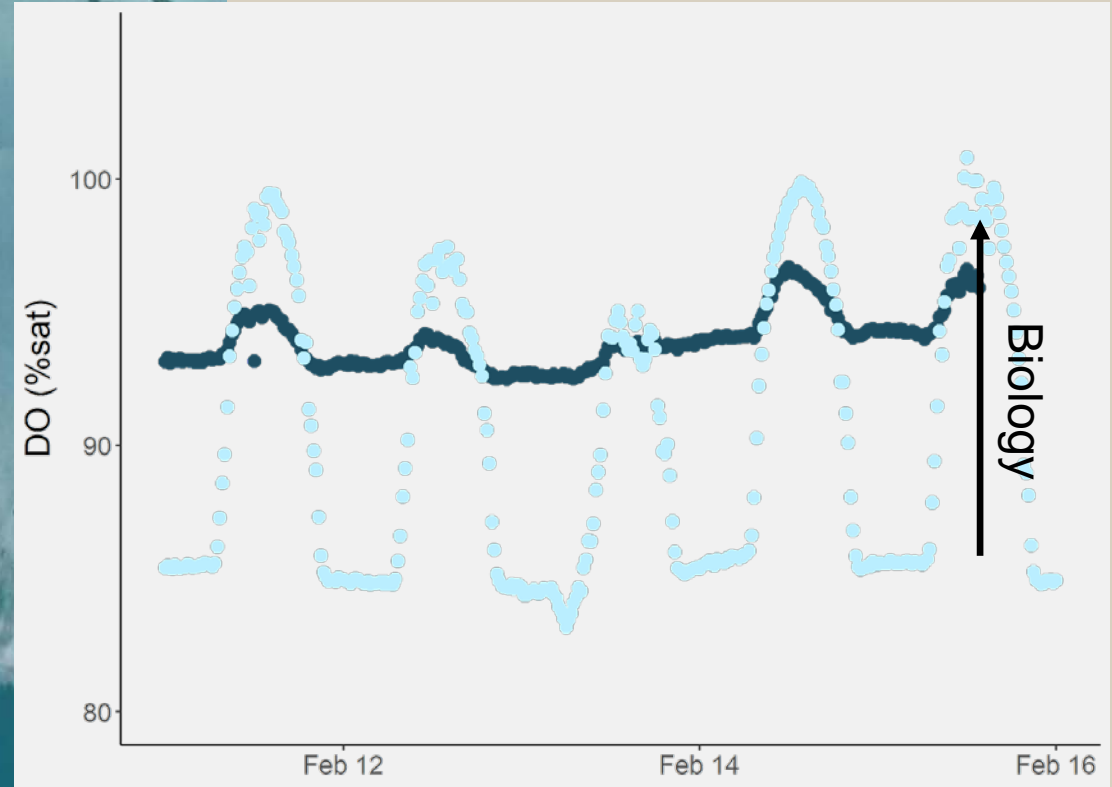
- Dissolved oxygen (DO)
- Light
- Temperature
- **Flow**



How do cross-braid flow differences affect river function?

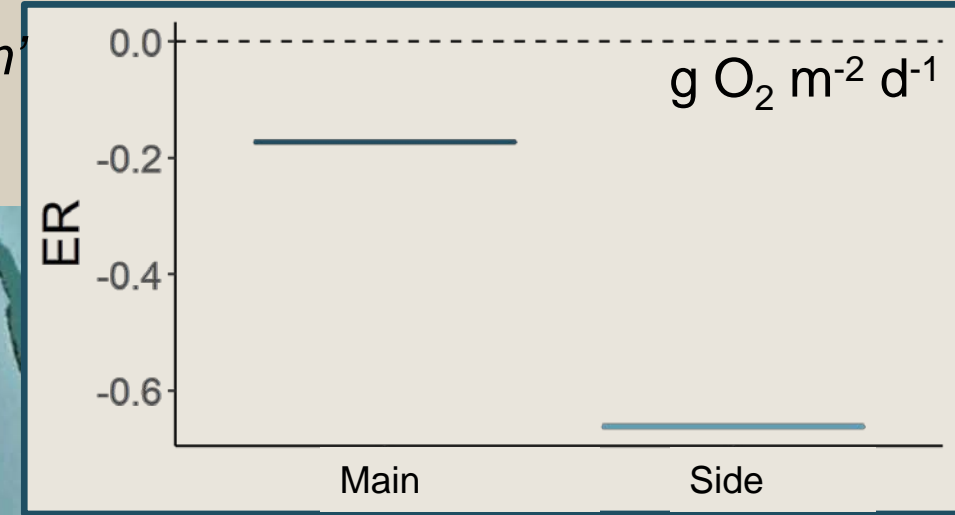


How do cross-braid flow differences affect river function?

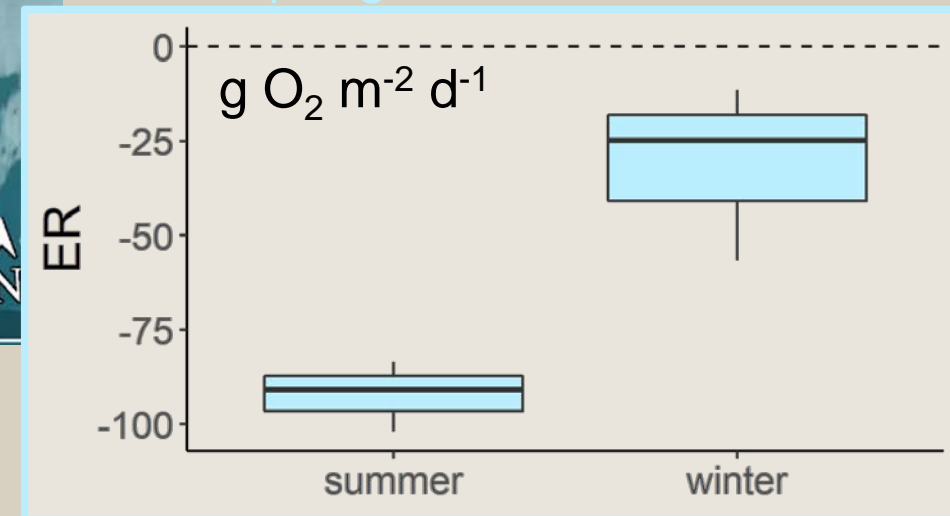
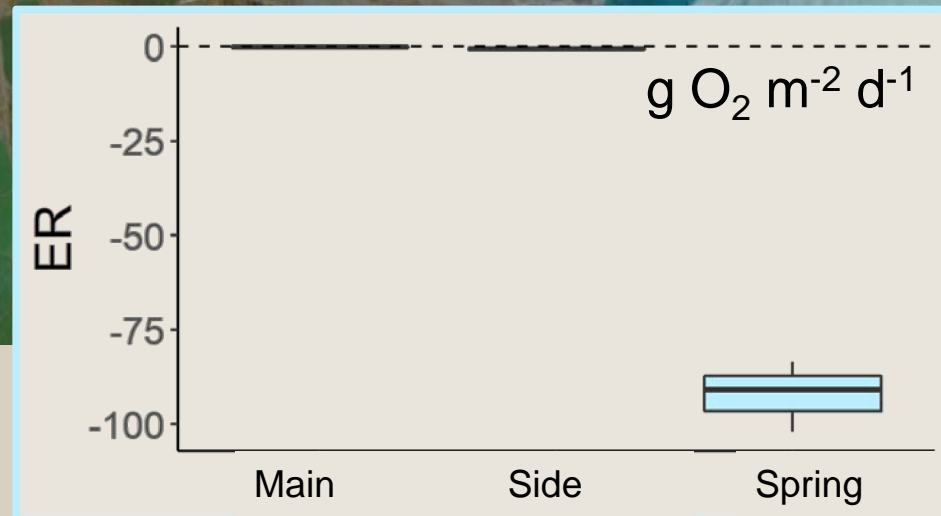


Changing flow → changing biological function

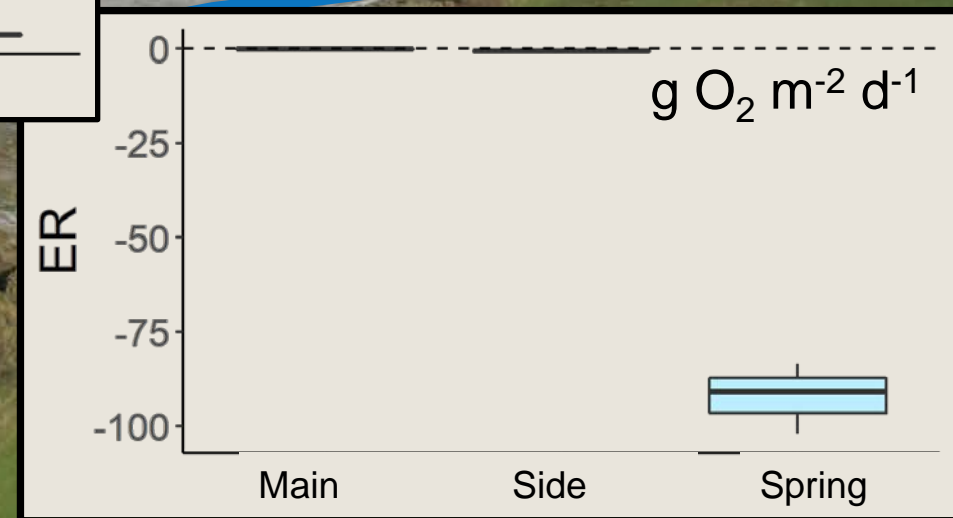
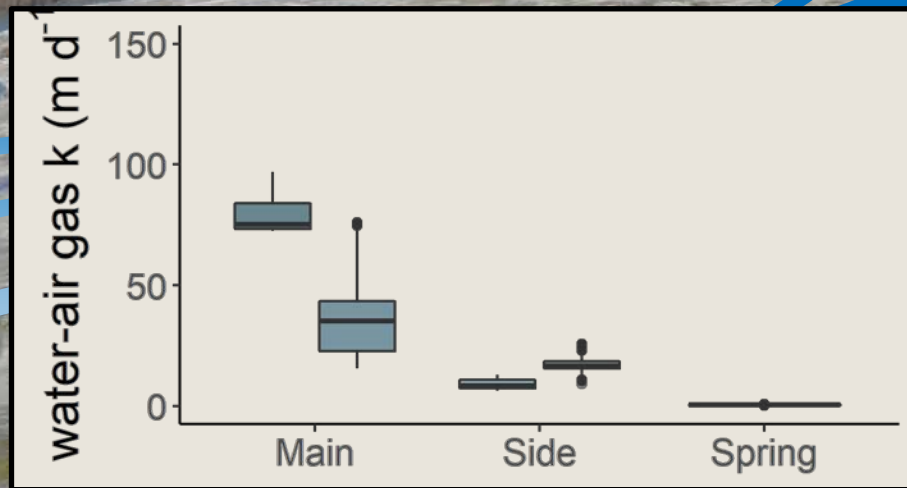
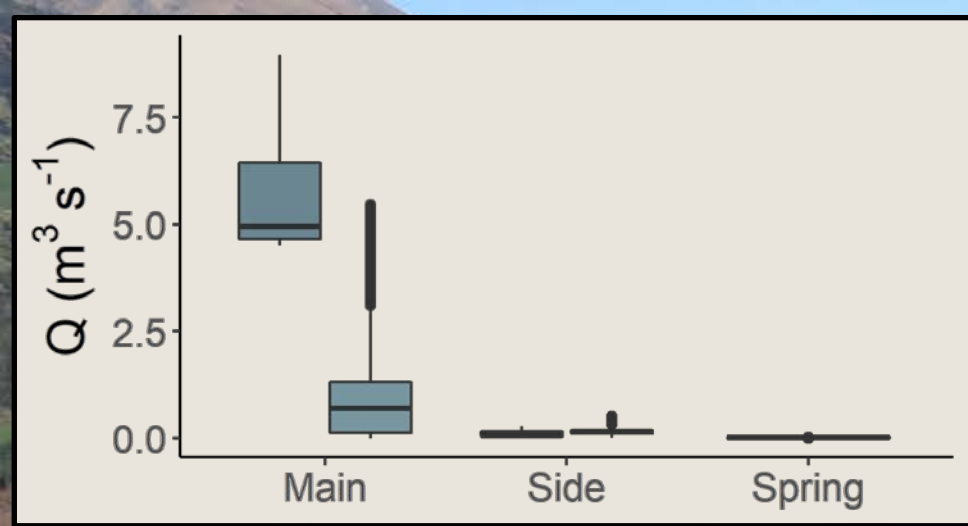
$ER = \text{'ecosystem respiration'}$



Spring winter v summer



Changing flow → changing biology → changing nitrogen?



Next steps

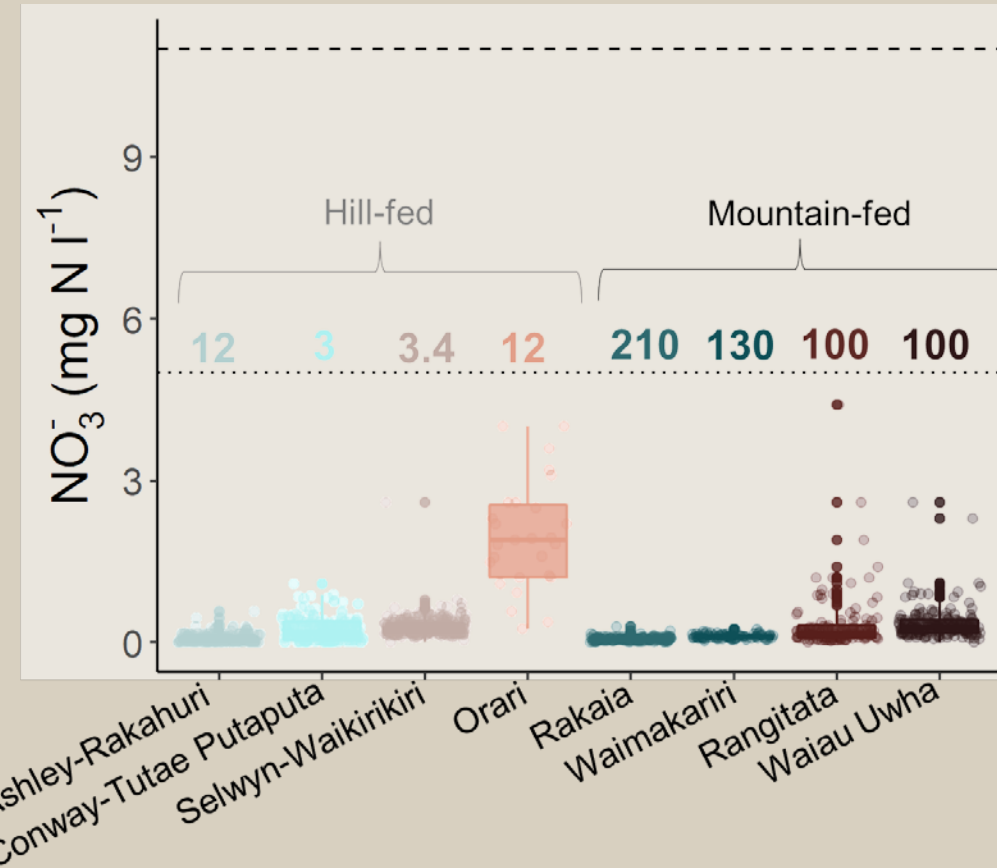
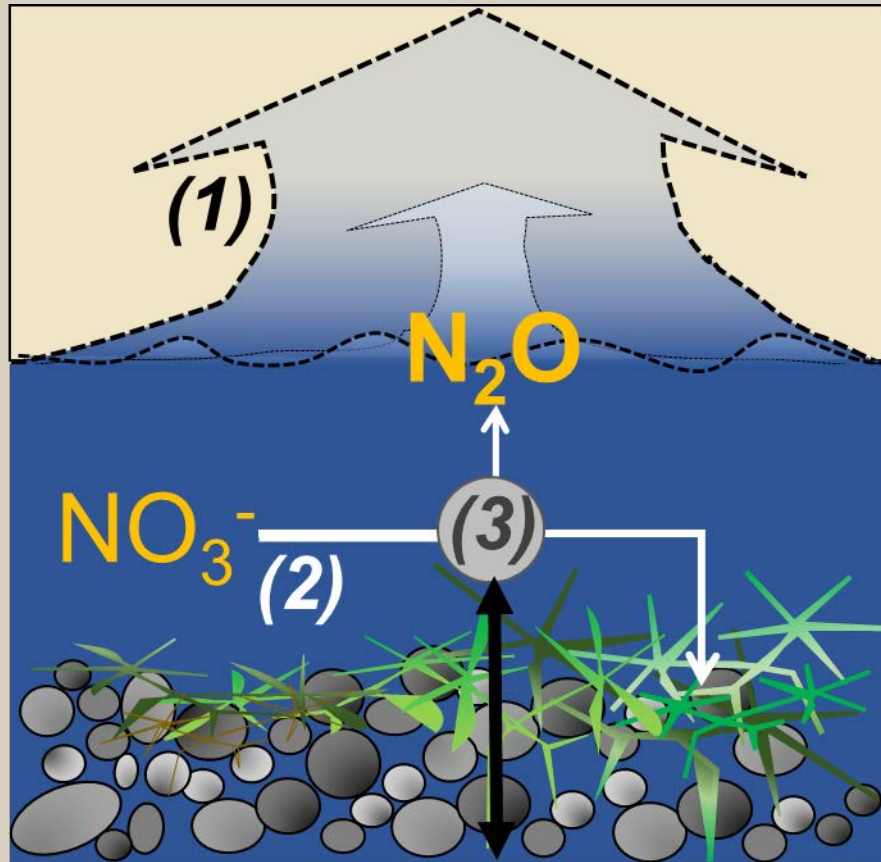
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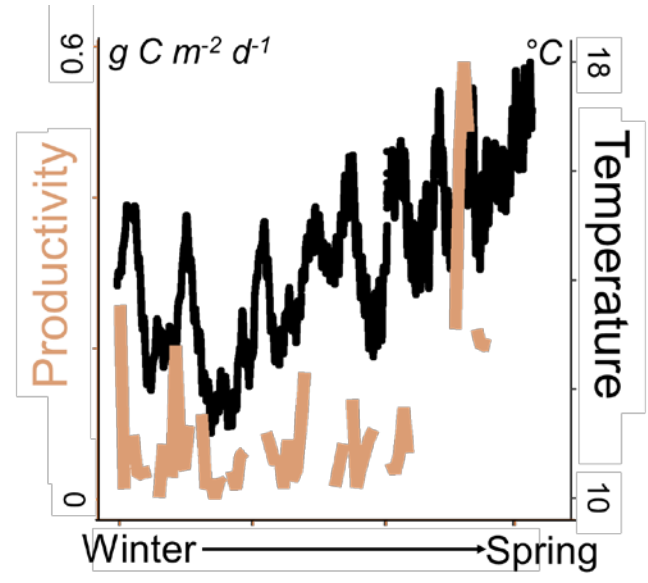
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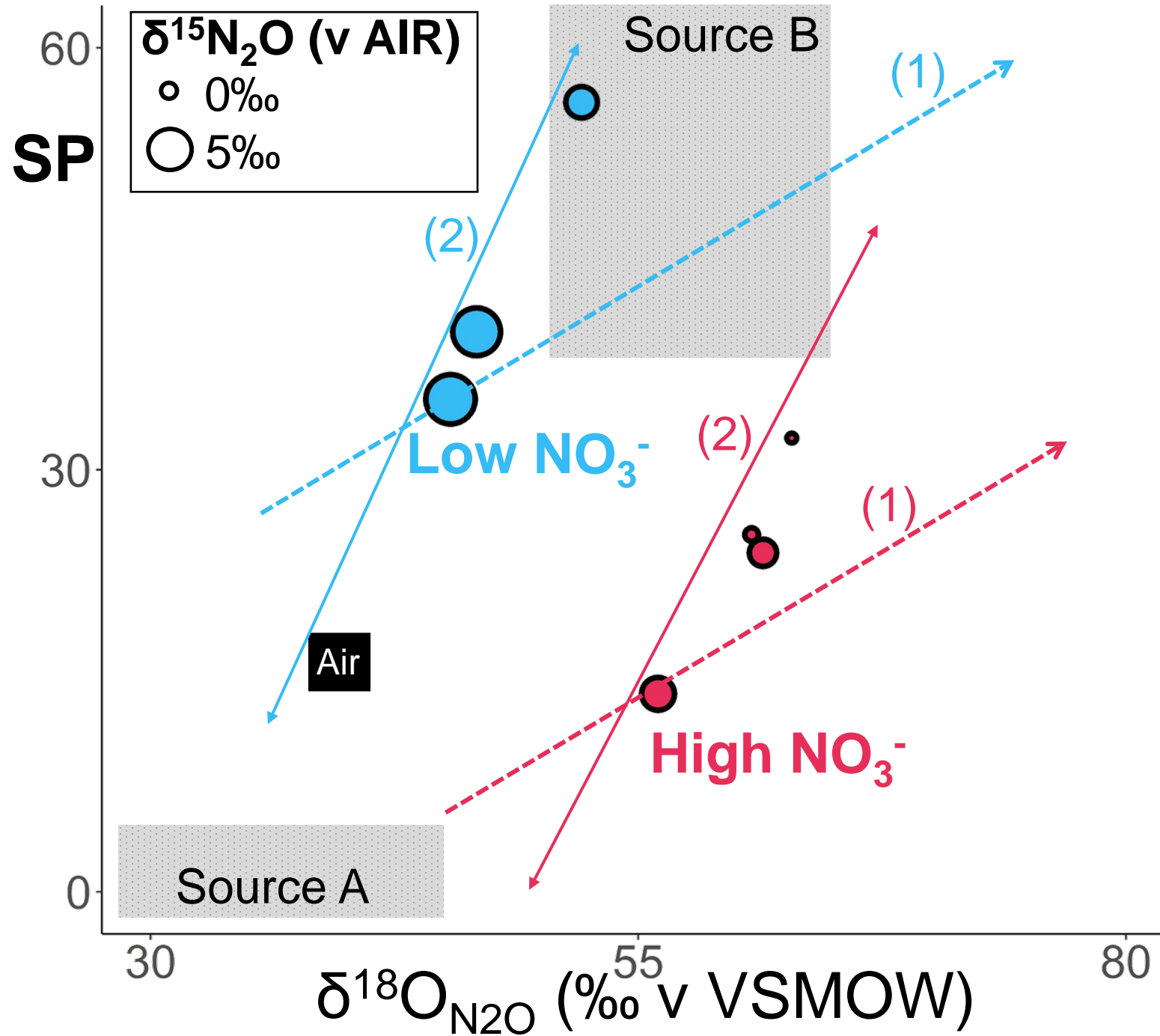


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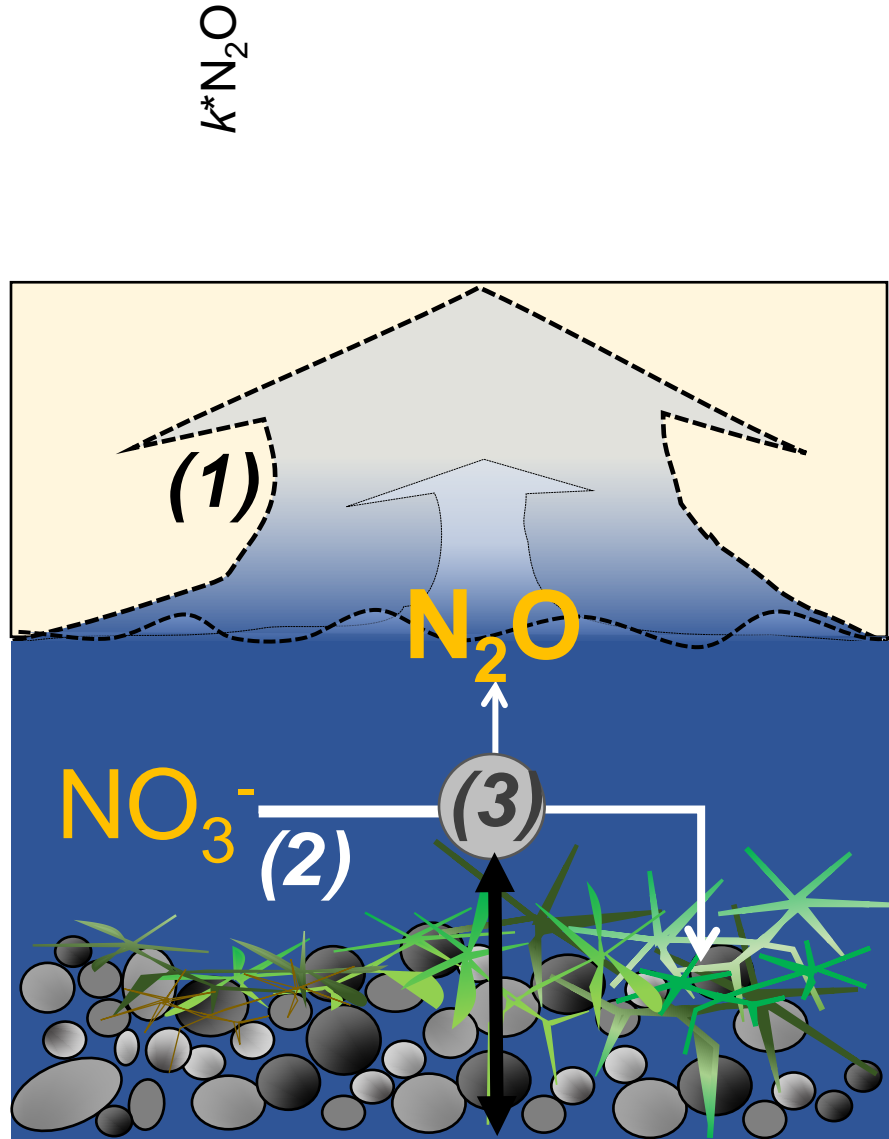


Some colour coding etc to show biological v hydrological mechanisms

Needs something that better shows 'hydrology'?

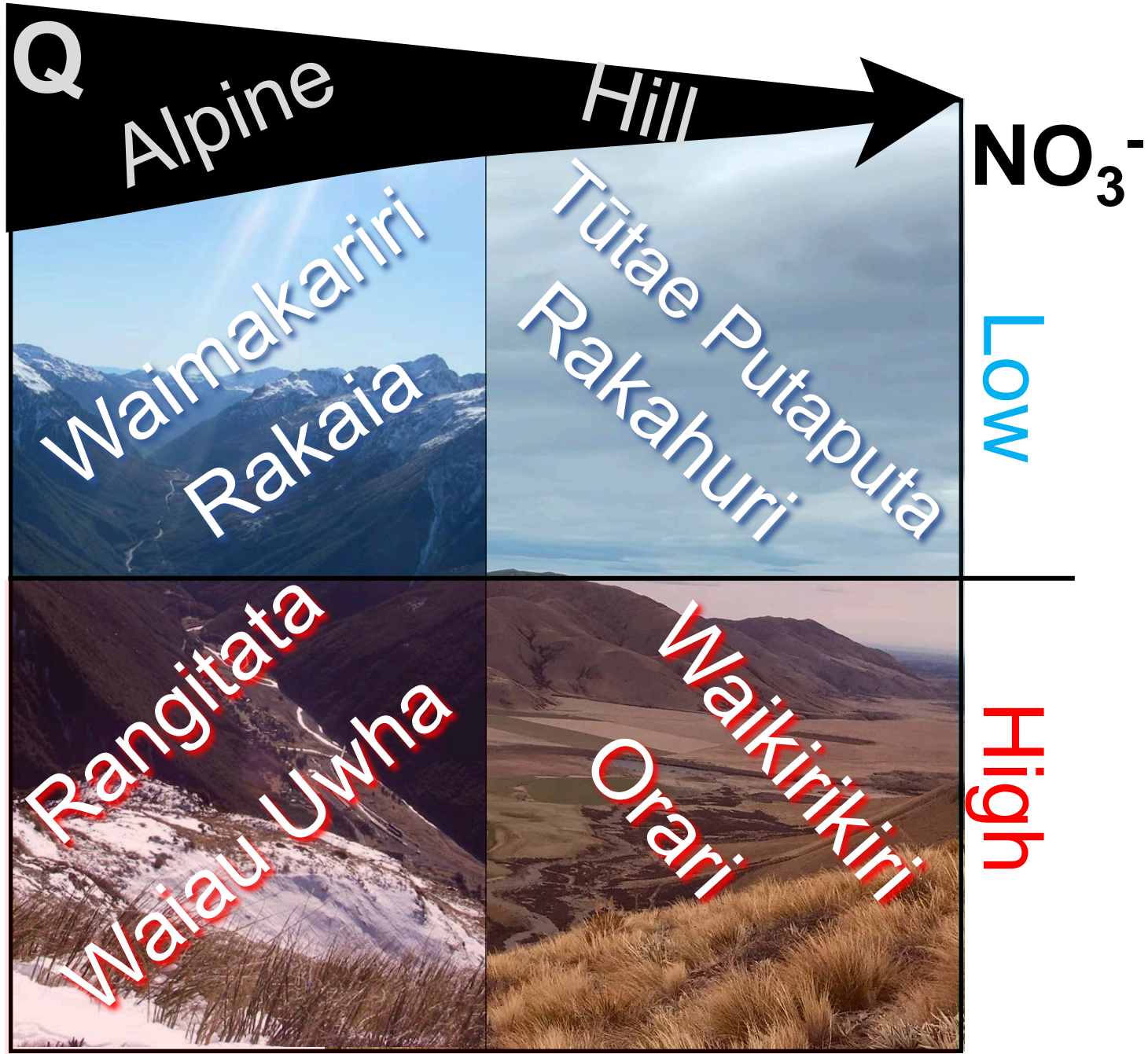
Maybe reverse colour scheme on outflow arrows to emphasise braided river v 'normal' lowland stream expectations?

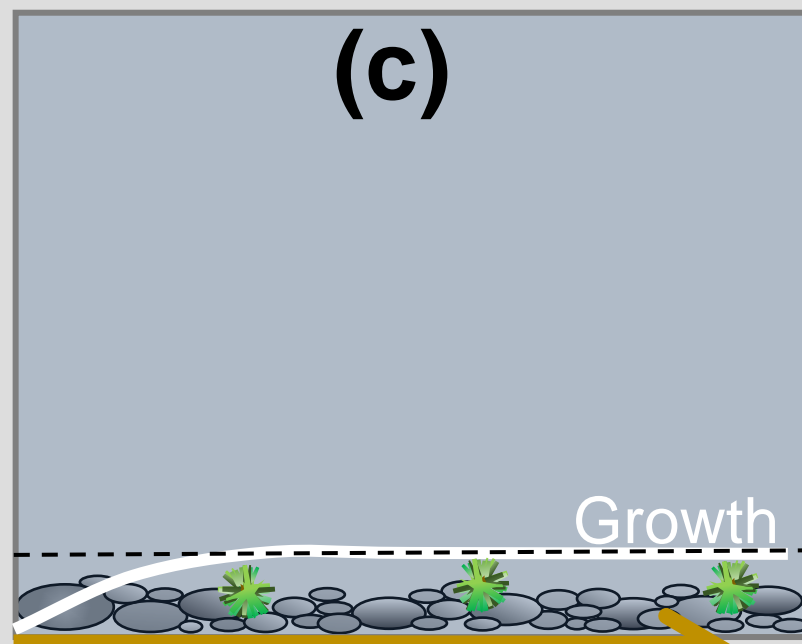
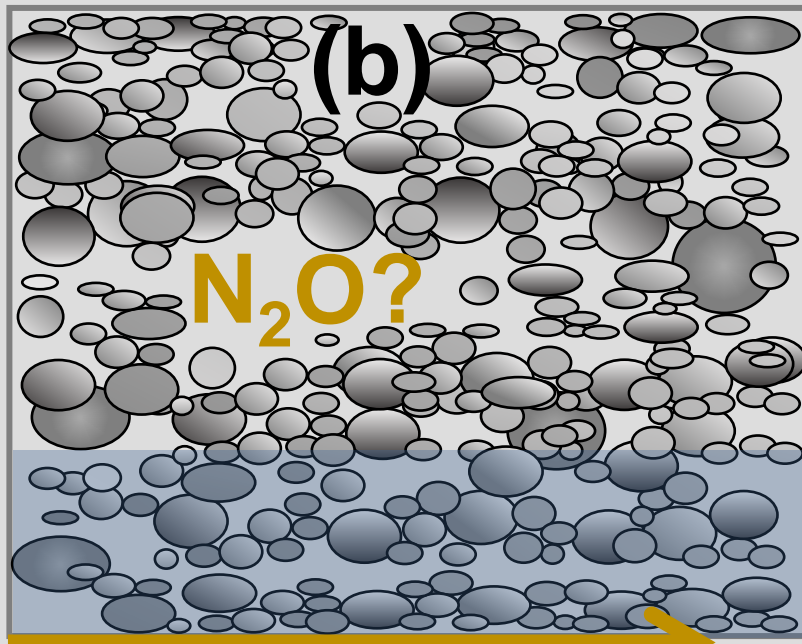
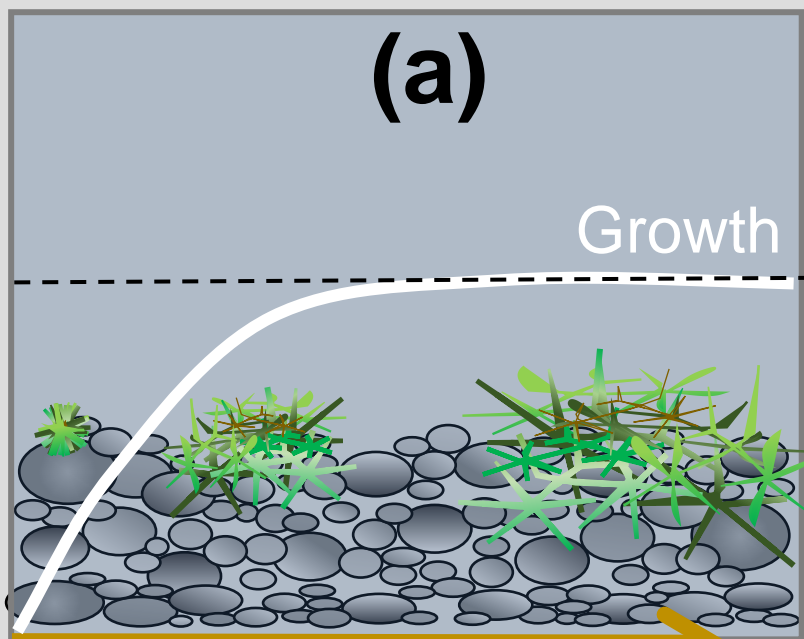
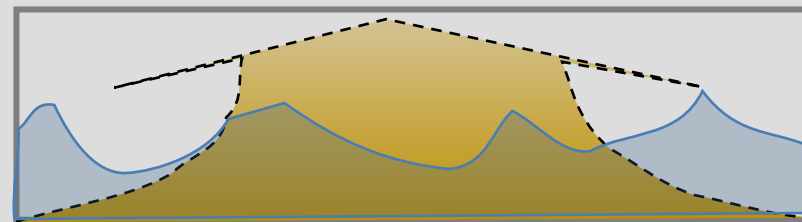
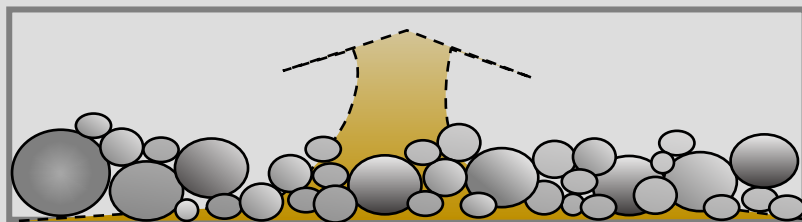
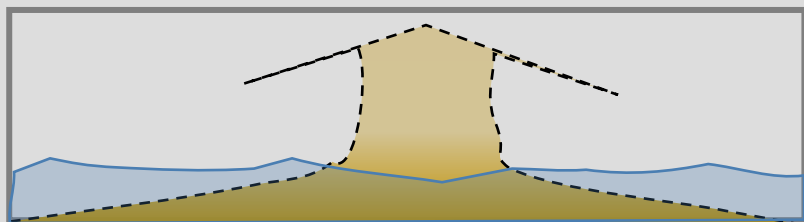
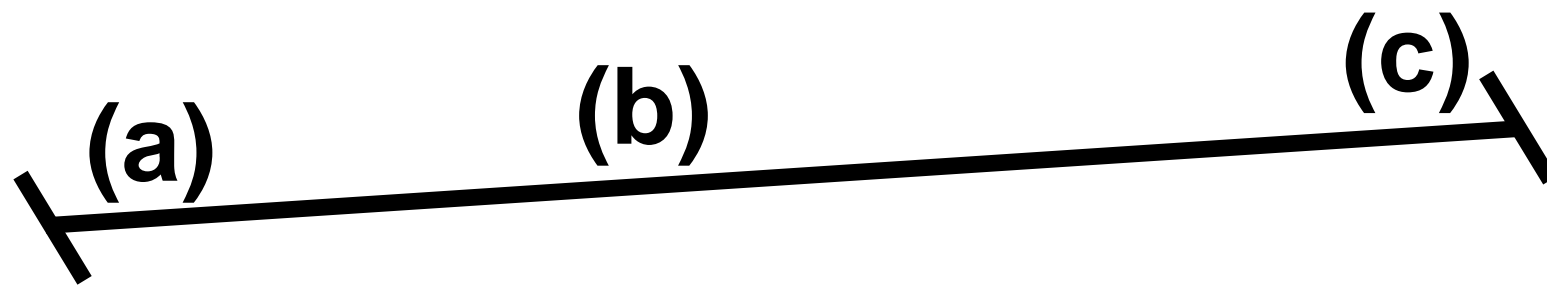
Remove GW or change somehow to emphasise hyporheic rather than GW?



Braided rivers significant N_2O sources

Hydrology v biology balance is key to predicting HOW significant these sources are





NO_3^-