

# Bioavailable DOC : reactive nutrient ratios control heterotrophic nutrient assimilation - An experimental proof of the macronutrient-imbalance hypothesis

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## Idea

### Macronutrient-imbalance (access) hypothesis

“Bio-reactive, dissolved nutrient concentrations (inorganic + bioavailable organic N & P) in freshwater ecosystems are controlled by heterotrophic microorganisms if the bio-reactive DOC : bio-reactive nutrient ratio is in a specific range.” derived from Stutter et al 2018, STOTEN

## Determination of bio-reactive DOC, N and P

Dissolved inorganic N ( $\text{NO}_3^-$ ,  $\text{NO}_2^-$ ,  $\text{NH}_4^+$ ) and P ( $\text{PO}_4^{3-}$ ) = 100% bio-reactive

Bulk dissolved C (DOC)  
N (DON) and P (DOP)

Bio-reactivity experiment,  
dark incubation with bacterial  
inoculum and EEM-PARAFAC to extract  
bio-reactive fluorophores

Bio-reactive DOC, DON and DOP

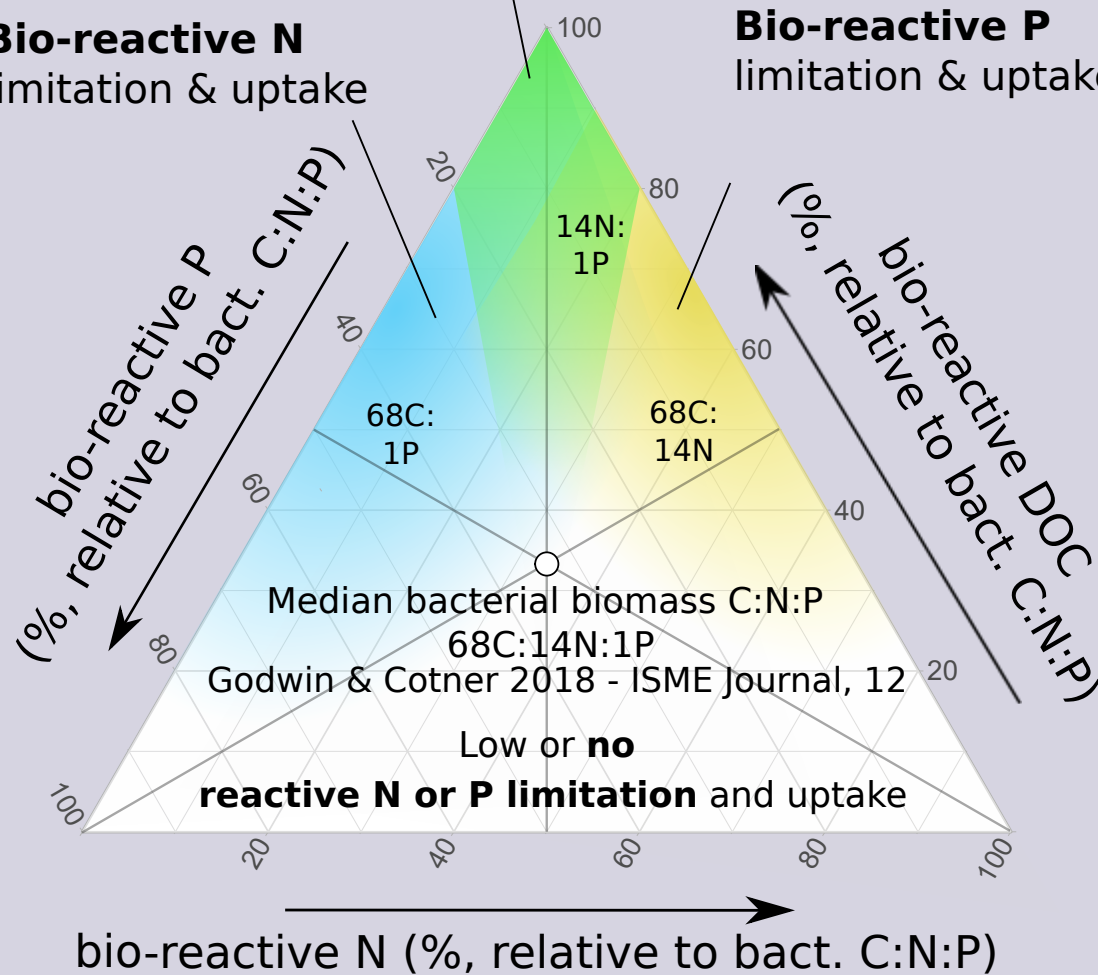
bio-reactive DOC, N and P (inorg. + bio-reactive org.)

## Linking macronutrients and bacteria

Bio-reactive N  
limitation & uptake

Bio-reactive N, P  
co-limitation & co-uptake

Bio-reactive P  
limitation & uptake



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