



**Analysis and simulation of the
Long-Term / Large-Scale interactions
of C, N and P
in UK land, freshwater and atmosphere**

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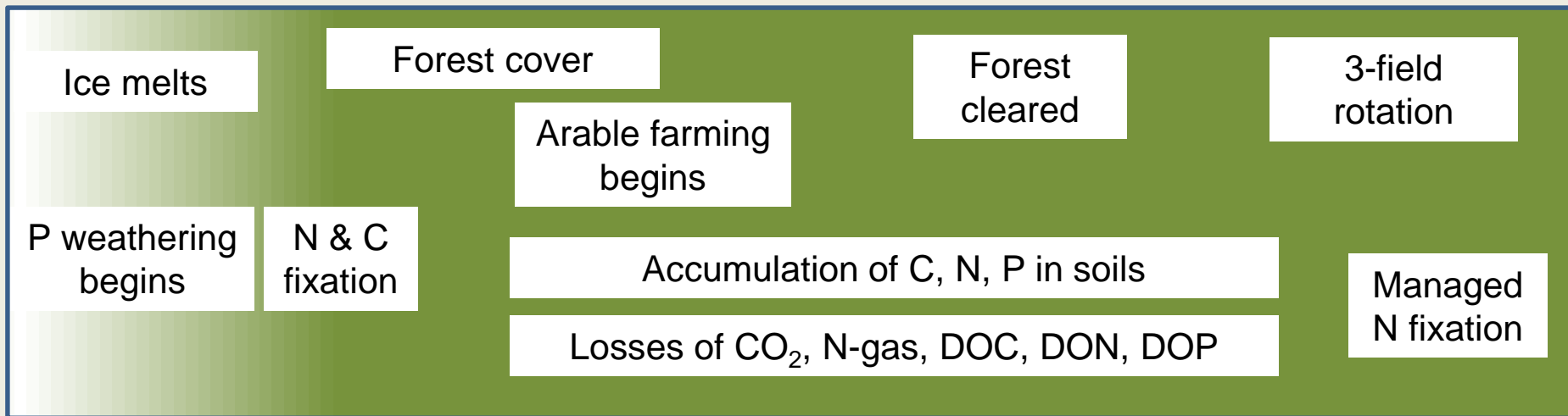
A short history of macronutrients in the UK

-10000

-5000

+1000

+1500

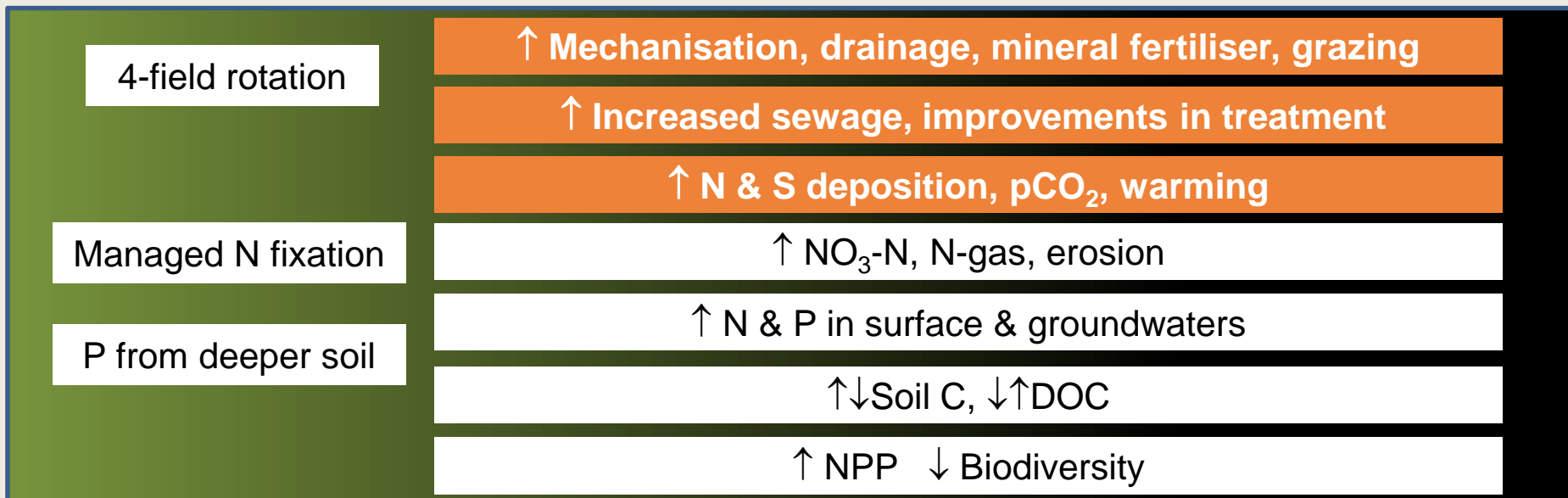


+1700

+1800

+1900

+2000



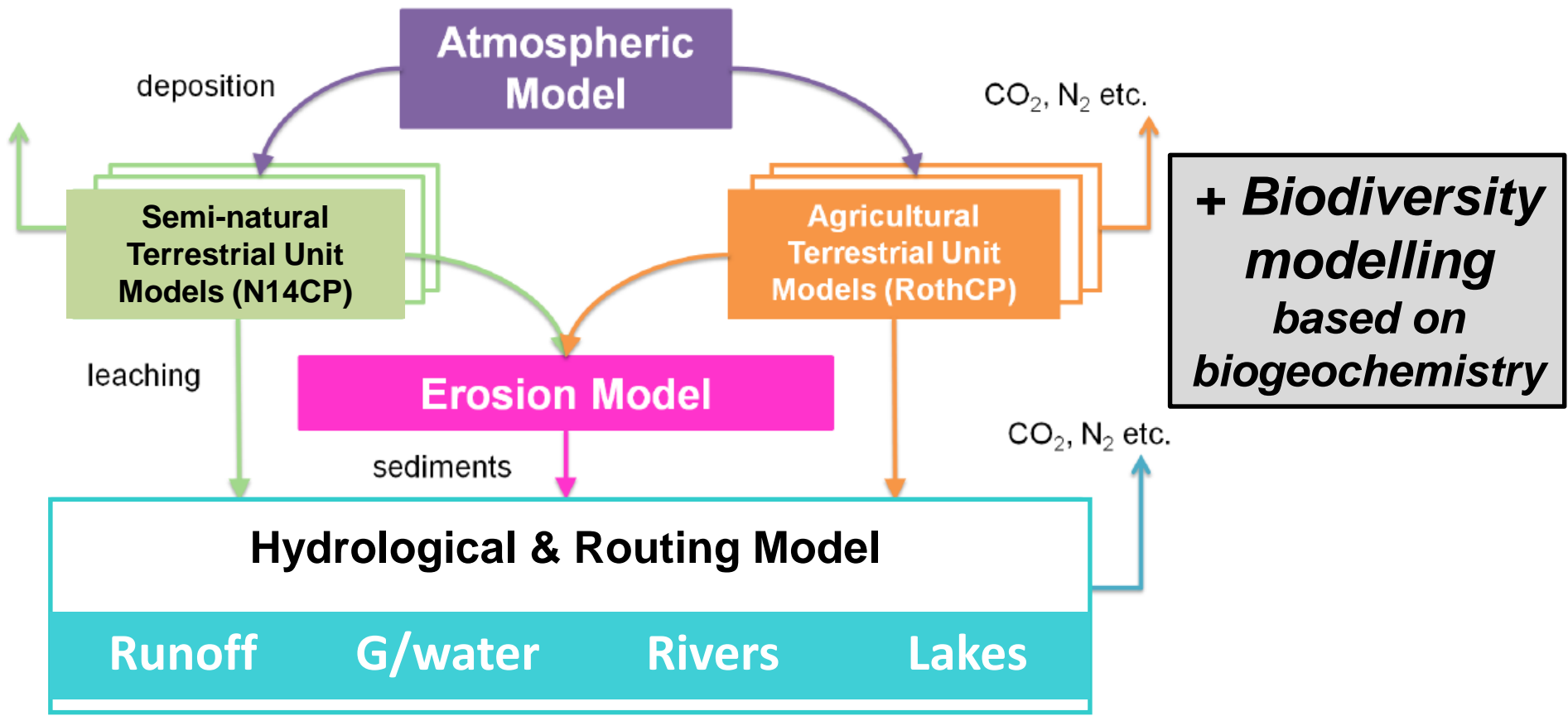
- Over the last 200 years, what have been the temporal responses of soil C, N and P pools in different UK catchments to nutrient enrichment?
- What have been the temporal responses of C and P transfers from land to the atmosphere and to estuaries?
- How has freshwater biodiversity responded to increased system productivity engendered by nutrient enrichment at different locations?

...or, how did we get to where we are today?

Answered by:

***integrated modelling analysis,
aimed at accounting for observable present element
pools and fluxes in different UK catchments
in terms of their nutrient enrichment histories***

***Followed by: scenario-based forecasting with
Stakeholder participation***

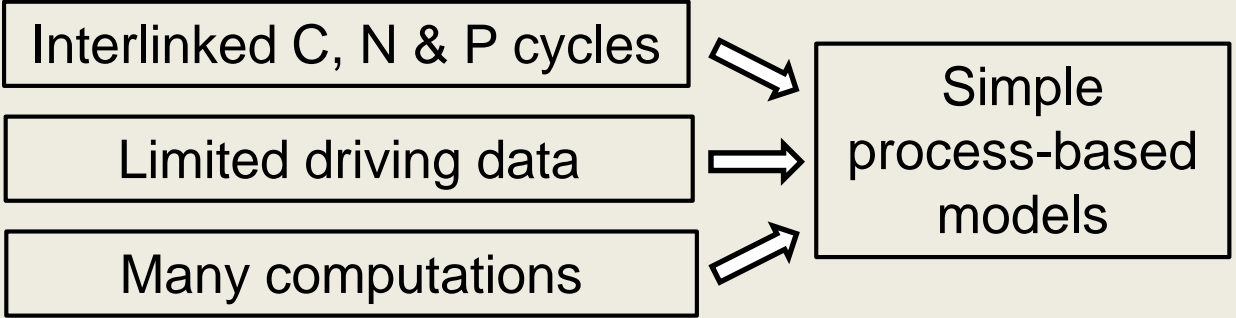


+ Biodiversity modelling based on biogeochemistry

+ Measurements

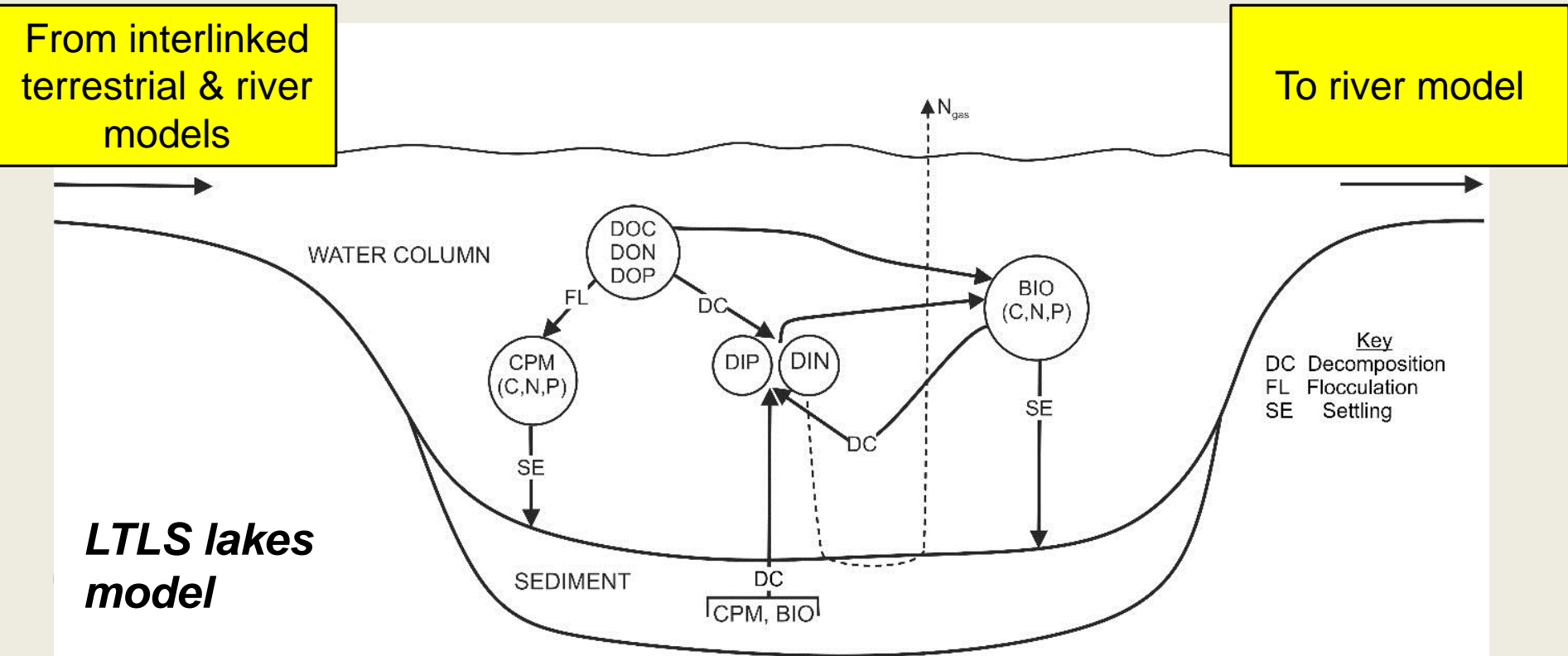
<i>soil denitrification</i>	<i>soil survey (¹⁴C)</i>
<i>river transport (¹⁴C)</i>	<i>lakes</i>
<i>fuel experiments</i>	<i>bracken survey</i>
<i>NPP</i>	<i>peat survey</i>

Modelling approach



“...we stick to the principle of simplifying to just short of the point of naivety.”

EC Rowe 2016



- The modelling is based on a 5×5 km grid for the UK (~ 10,000 cells)
- Model time-steps vary, e.g.
 - 3-monthly for semi-natural terrestrial ecosystems
 - 2-hourly for river transport (*although monthly output*)
- Most calculated values are not calibrated