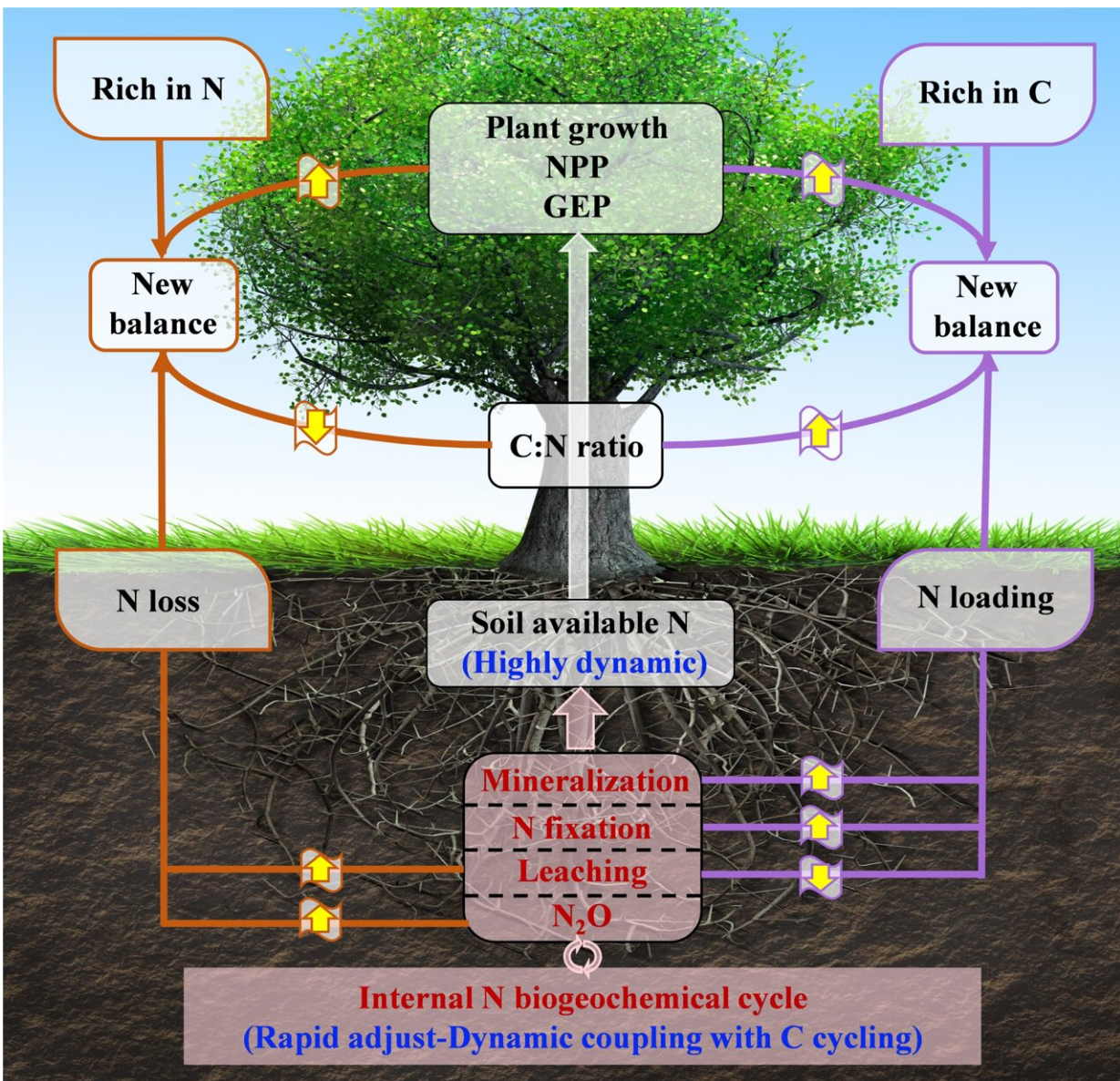


Dynamic carbon-nitrogen coupling under global change

March 2 2023



NPP, net primary productivity; GEP, gross ecosystem productivity. Credit:

A new study reveals that both the carbon and nitrogen cycles continually adjust under global change, leading to dynamic coupling.

A study published in the journal *Science China Life Sciences* recently made a comprehensive review of ecosystem [carbon](#) and nitrogen processes under global change. The review shows that nitrogen input mostly stimulates plant primary productivity, decreases microbial activities, hardly increases soil carbon sequestration but considerably increases nitrogen loss by nitrogen leaching and nitrogenous gas emissions.

Carbon input under rising atmosphere CO₂ concentration, climate warming, or along ecosystem succession stimulates [nitrogen fixation](#) and mineralization but decreases nitrogen leaching to support plant growth and ecosystem carbon sequestration. The carbon and nitrogen processes continually adjust under global change to couple with each other under a new dynamic equilibrium.

The shifts in carbon-nitrogen coupling have important implications for modeling ecosystem carbon sequestration under [global change](#). The ecosystem carbon sequestration may be overestimated under nitrogen input and be underestimated under elevated CO₂ when the ecosystem models fail to simulate these dynamic adjustments of carbon and [nitrogen cycles](#).

More information: Shuli Niu et al, Dynamic carbon-nitrogen coupling under global change, *Science China Life Sciences* (2023). [DOI: 10.1007/s11427-022-2245-y](#)

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