

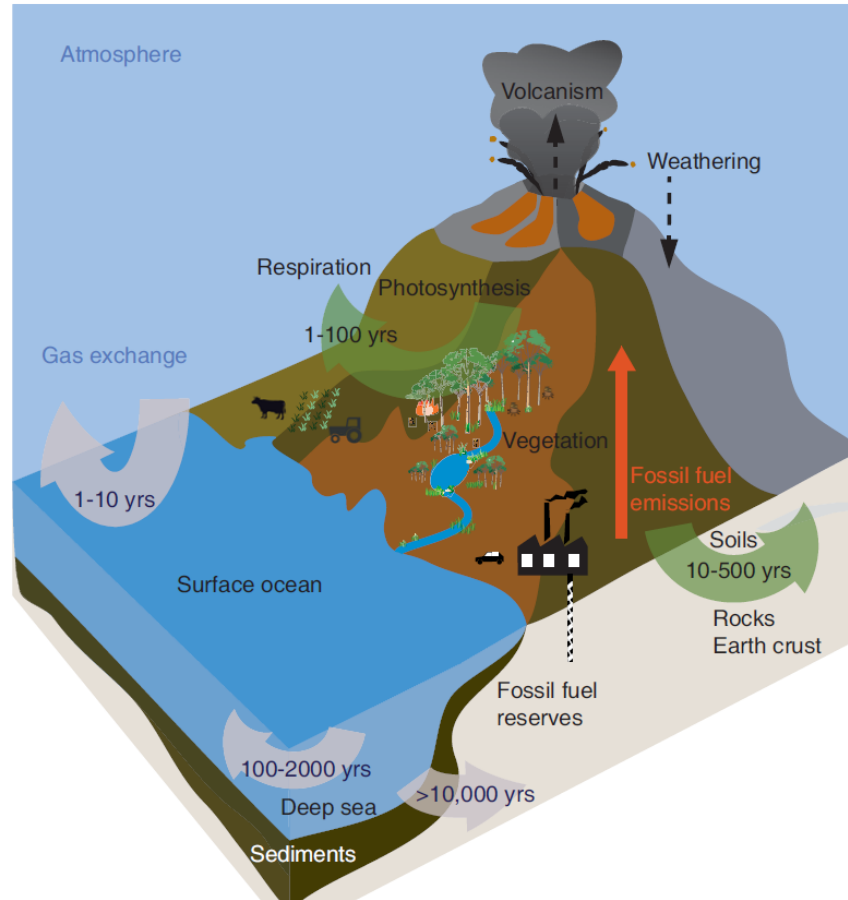
Contribution of bioenergy to long-term climate outcomes

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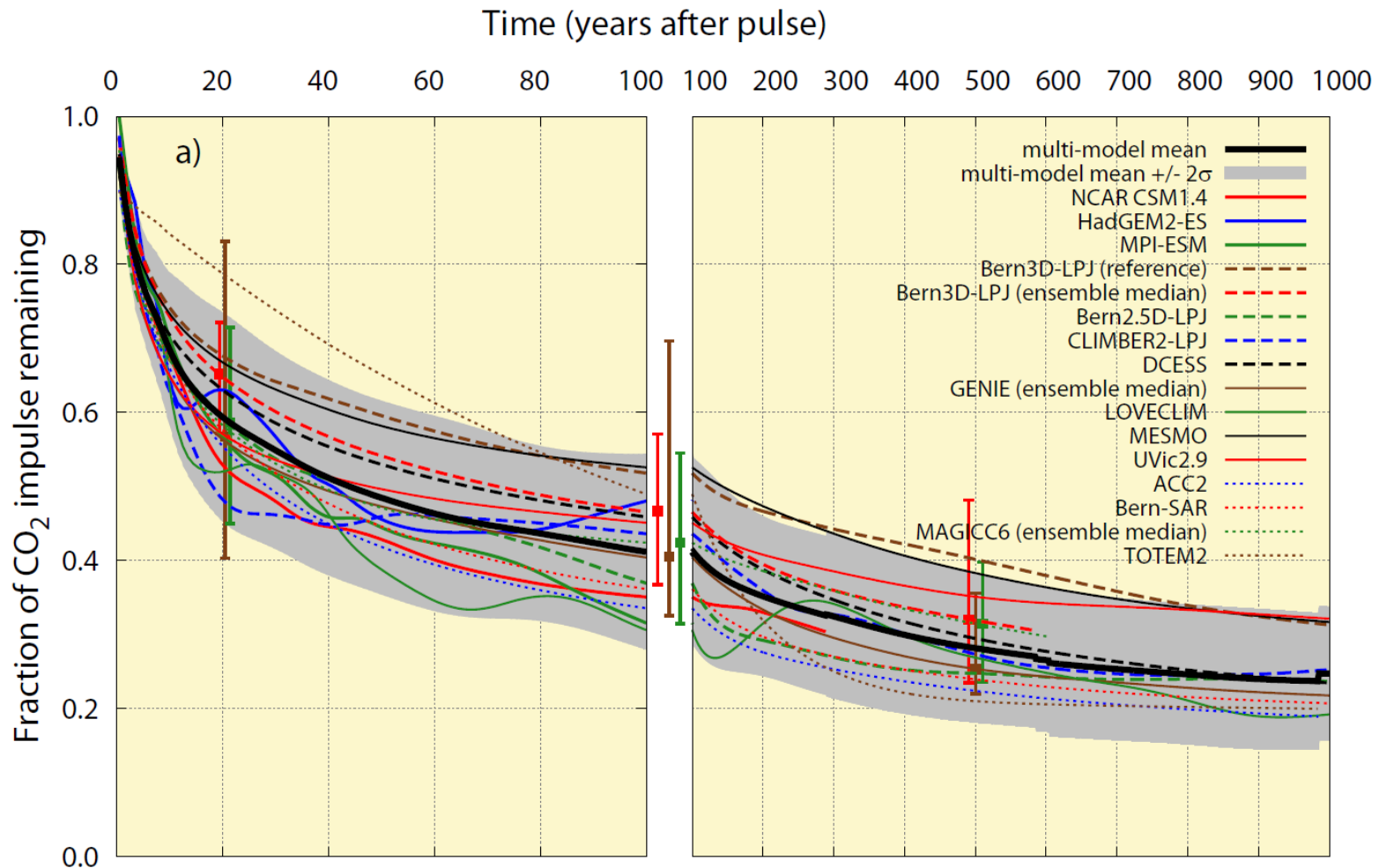
Francesco Cherubini

The slow and fast domain of the global carbon cycle



“Fossil fuel extraction from geological reservoirs, and their combustion, has resulted in the transfer of significant amount of fossil carbon from the **slow domain** into the **fast domain**, thus causing an unprecedented, major human-induced perturbation in the carbon cycle” (5AR WGI CH 6.111)

15%-40% of a pulse of anthropogenic CO₂ remain in the atmosphere after 1000 yrs (IPCC WGI CH6)



Cumulative total emissions of CO₂ and global mean surface temperature response are approximately linearly related (see Figure SPM.10). SPM WGI 5AR

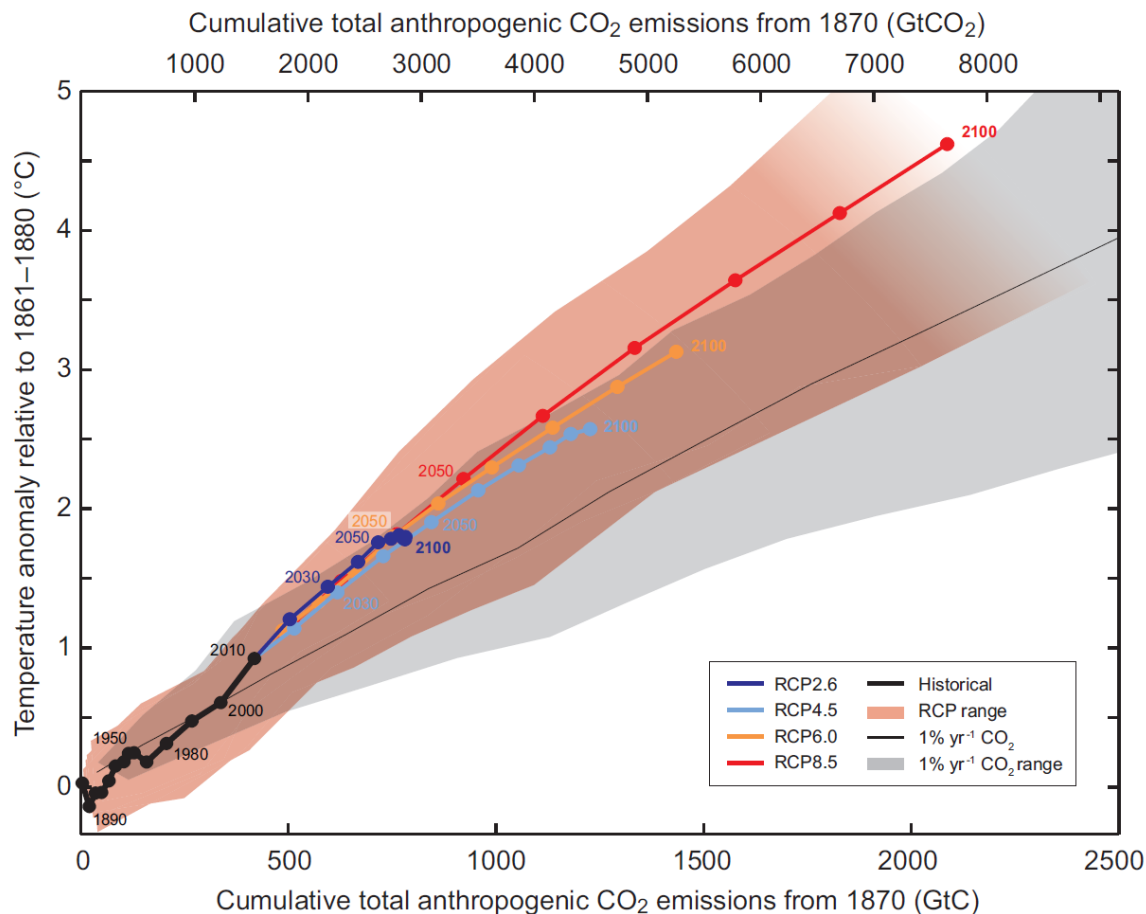
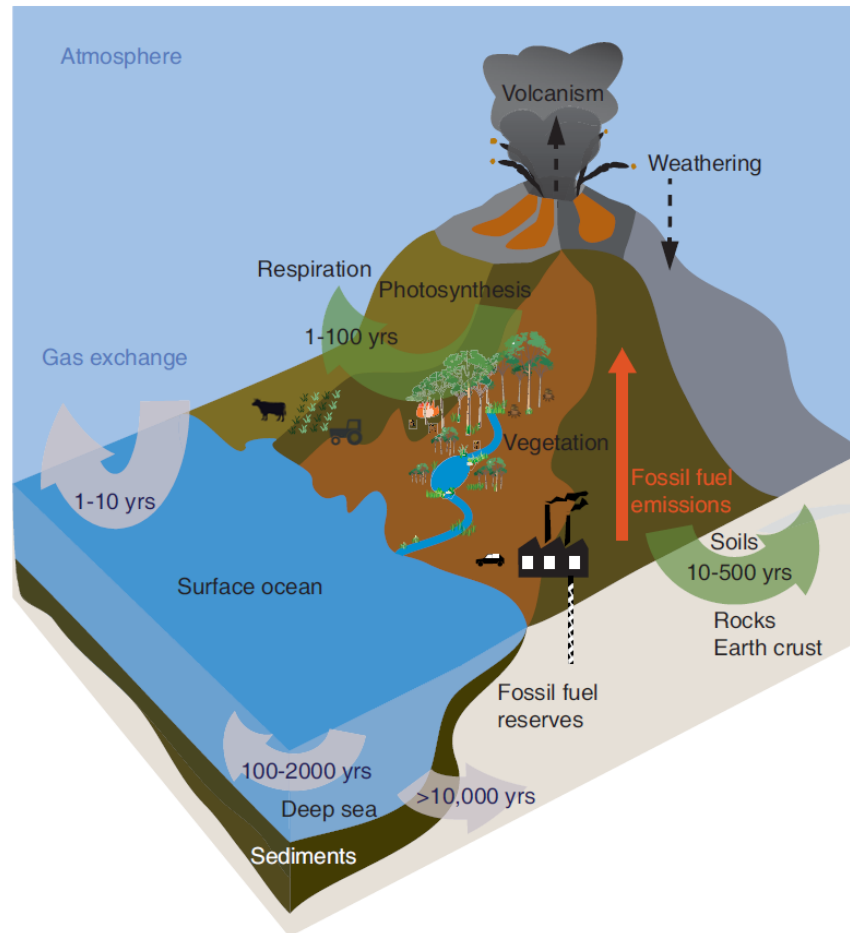


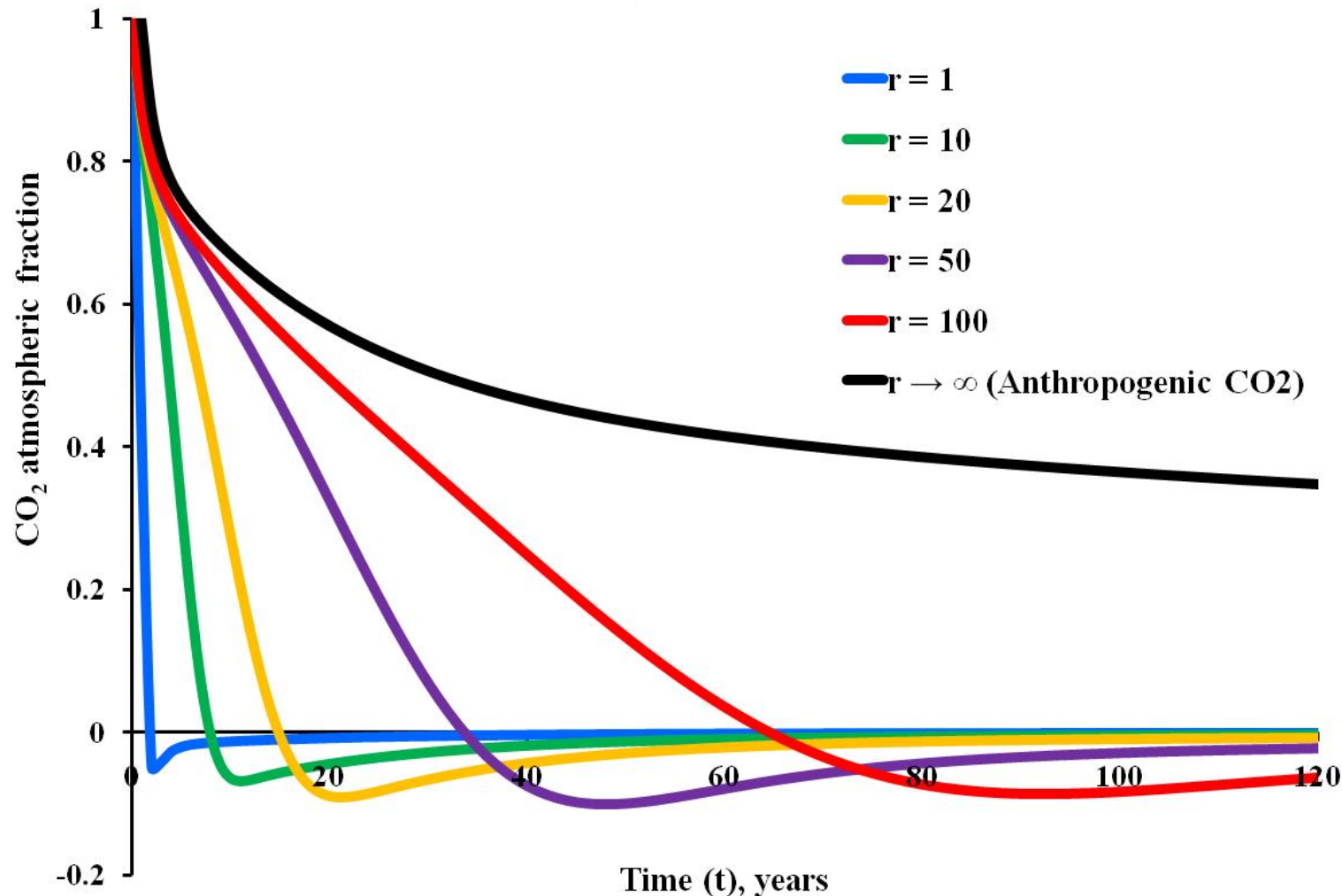
Figure SPM.10 | Global mean surface temperature increase as a function of cumulative total global CO₂ emissions from various lines of evidence. Multi-

How to understand perturbations to the fast domain of the carbon cycle



FAQ 6.1, Figure 1: Simplified schematic of the global carbon cycle showing the typical turnover time scales for carbon transfers through the major reservoirs.

Response in the fast domain is faster than the response in the slow domain



The long term implications of perturbing the slow vs the fast carbon cycle

