

GREENING OF EARTH DOES NOT COMPENSATE FOR RISING SOIL RESPIRATION

The concentration of carbon dioxide (CO_2) is increasing on account of anthropogenic activities. Since climate change affects both temperature and precipitation across the world, it also influences how vegetation can capture carbon. The same drivers also influence how much carbon is emitted by microbial respiration in soils. In our study, we tried to understand whether the rate at which vegetation is capturing carbon can outpace the rate at which soil respiration is emitting carbon from soil, under present and future climate change scenarios. We find that, despite

increased photosynthesis by vegetation across majority of the globe, the ability of plants to curb atmospheric CO_2 levels is diminishing (Fig.). Therefore, future managements practices must not just include afforestation, but also understand the role of soils for effective carbon management.

Reference: Naidu, DGT, Bagchi, S. (2021). Greening of the earth does not compensate for rising soil heterotrophic respiration under climate change. *Global Change Biology* 27(10):2029– 2038. <https://doi.org/10.1111/gcb.15531>

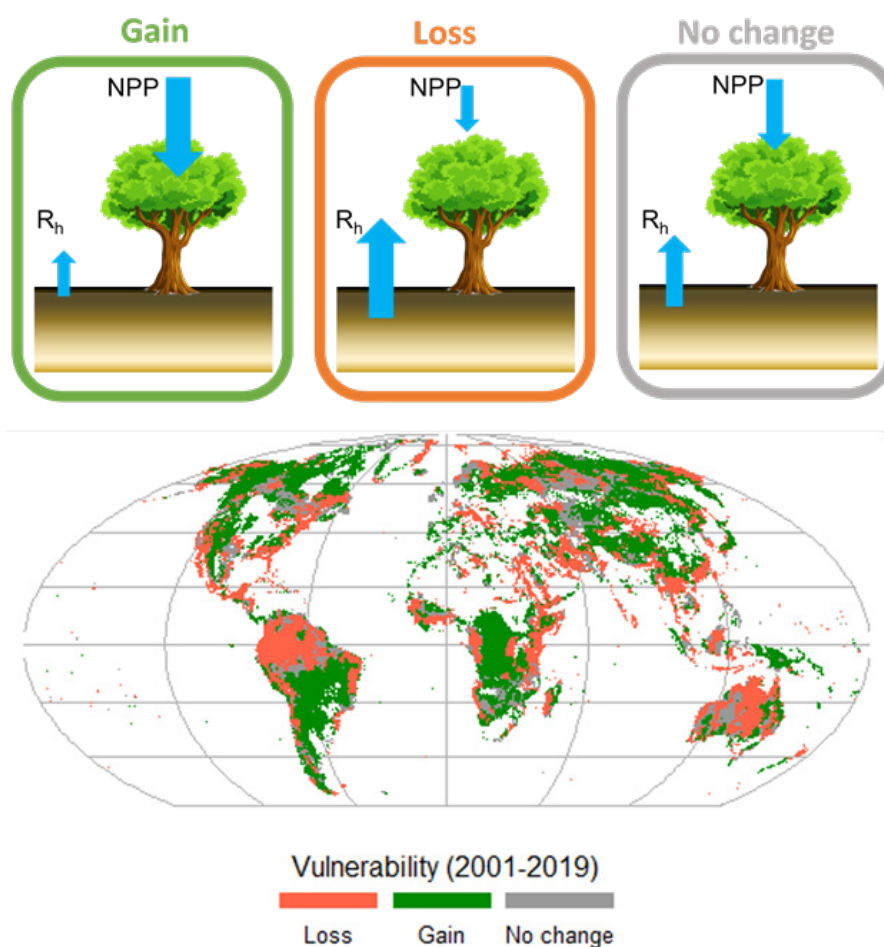


Figure: The net change in the soil-C pool during the period 2001-2019 due to joint effect of temperature and precipitation. The balance between net C-fluxes determines whether the soil-C pool shows gain (green), loss (red), or no change (grey) in the soil-C pool. The global distribution of C-loss and C-gain hotspots are shown in the global map.