Enhanced dominance of soil moisture stress on vegetation growth in Eurasian drylands

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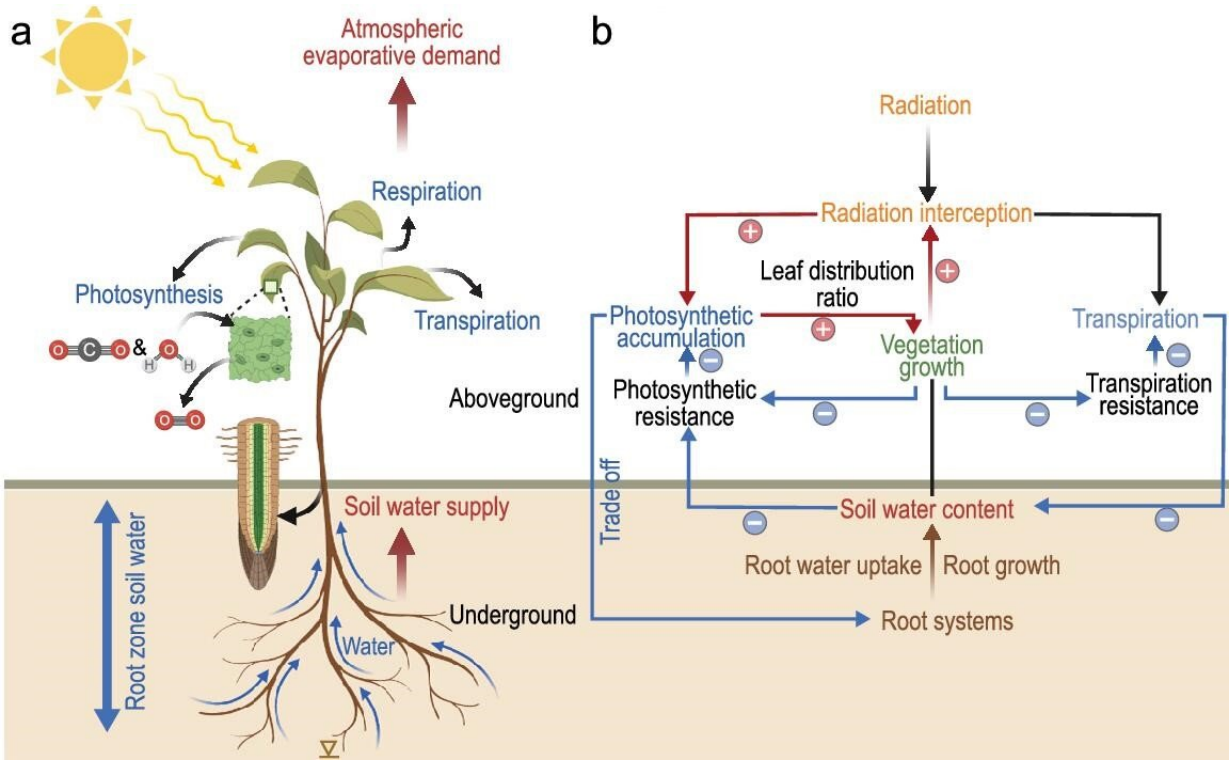

Conceptual illustration of plant-centric interpretation of vegetation water stress through the pathways of atmospheric evaporative demand and soil water supply. Credit: *National Science Review* (2023). DOI: 10.1093/nsr/nwad108

In a new study, a group from Institute of Geographic Science and Natural Resources Research, Chinese Academy of Sciences, proposed a concept of ecosystem water stress and comprehensively compared the

impacts of high atmospheric vapor pressure deficit and low soil water content on vegetation growth in Eurasian drylands

Drought, a multifaceted phenomenon encompassing atmospheric and soil drought, has sparked a lively debate over which type of dryness stress exerts a more significant impact on vegetation growth. "Through our defined concept of ecosystem water stress, we can discern where water-stressed vegetation growth is dominated by atmospheric vapor pressure deficit or soil moisture," Dr. Yu Zhang, first author of this work, says.

The team shows soil moisture dominated the dryness stress of vegetation growth over Eurasian drylands. Astonishingly, none of the 18 state-of-the-art vegetation gross primary productivity models describe soil water dominance. As climate change progresses, it is projected that soil moisture stress will continuously constrain vegetation growth towards 2100.

These findings lay a crucial scientific foundation for effective ecosystem management and drought mitigation across Eurasian drylands. Led by Prof. Yangjian Zhang and Dr. Yu Zhang from Institute of Geographic Sciences and Natural Resources Research, Chinese Academy of Sciences, the study has been published in *National Science Review*.

More information: Yu Zhang et al, Enhanced dominance of soil moisture stress on vegetation growth in Eurasian drylands, *National Science Review* (2023). DOI: 10.1093/nsr/nwad108

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