**Abstract:**

More frequent droughts are altering the dynamics and function of the European forest ecosystem, which is deeply connected to the global carbon cycle. Tree height is an important structural feature of forests; however, how it regulates the response of forests to droughts remains controversial. By comprehensively examining the variations of satellite-based vegetation greenness with drought evolution in Europe, we observed apparent height-dependence forests' resistance to drought. Short trees show lower resistance to drought than tall trees, demonstrating earlier and larger negative vegetation anomaly. However, short trees present more rapid recovery when released from the drought. Although tall trees are more resistant to short-term water stress, prolonged drought may cause more serious damage. The observed resistance differences can be attributed to the differences in the capacity for water absorption and regulation among forests of different heights. These findings are critical to our understanding of the response of forests under drought stress.