



Federal Ministry
of Food
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UNECE

Convention on Long-range
Transboundary Air Pollution



On the Pulse of European Forests

40 years of Pan-European Forest Monitoring:
From Air Pollution to Climate Change

ICP Forests 40th Anniversary Report under the UNECE Convention
on Long-range Transboundary Air Pollution (Air Convention)

wge Working Group on Effects of the
Convention on Long-range
Transboundary Air Pollution



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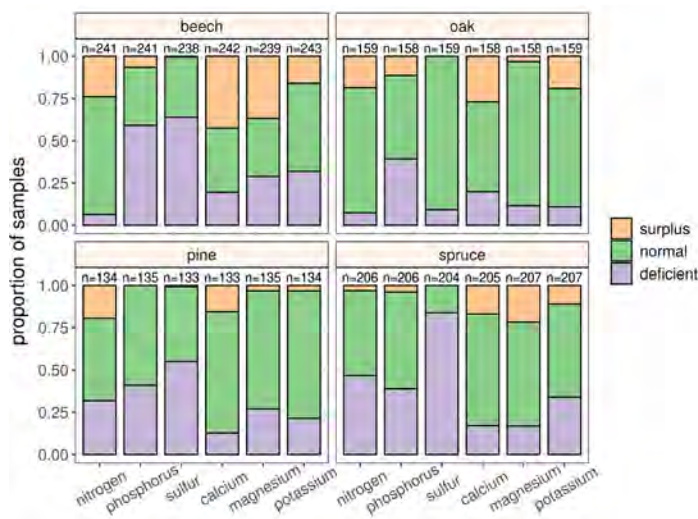


Tree foliage and litterfall reveal declining tree nutritional status and improve the assessment of carbon dynamics

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Nutrient supply and balance are essential for healthy forests. Analyses of foliar nutrients can reveal nutrient deficiencies and/or toxicities and can indicate a biological response to environmental changes. ICP Forests monitors the nutritional status of forest trees in Level II plots.

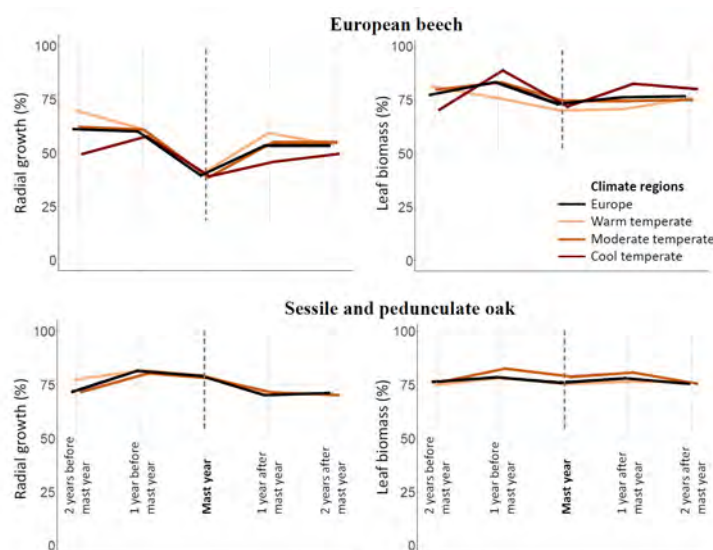


Decline of nutritional status of European forest trees

Analysis of overall trends reveals significant declines in foliage concentrations of several nutrients in the main European forest tree species. Such declines in foliar nutrients may lead to nutritional deficiencies (see bar graph on the left). (Jonard et al., 2015; Talkner et al., 2015; Braun et al., 2020; Peñuelas et al., 2020; Du et al., 2021).

Improvement of the estimation of carbon and nutrient fluxes to forest soils

More than 1,600 ICP Forests annual litterfall observations form the basis for modelling litterfall carbon and nutrient fluxes. The total annual amount of carbon, nitrogen, phosphorus, and potassium transferred to European forest floors via litterfall has been estimated to be 351 Tg, 8.2 Tg, 0.6 Tg, and 1.9 Tg, respectively. (Neumann et al., 2018)



Mast years and resource dynamics

With annual litterfall data, we can identify spatially synchronized high fruiting years (mast years). During those years, radial growth of tree stems and leaf biomass decreases in beech. In contrast, oak species exhibit no change in vegetative growth. (Nussbaumer et al., 2021)



<http://icp-forests.net>

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