Global Change and mast seeding of European tree species. The EUROMASTING project

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Mast seeding - the highly variable seed production among years - is very common in tree species, but there is no consensus about its main causes and the extent to which the altered environmental conditions could affect it. The increasing aridity predicted by global change models may negatively affect seed production in dominant tree species by reducing the size of the annual seed crop and/or likely by disrupting the environmental cues that synchronize plants for masting. However, the impact of increasing drought on initial stages of regeneration such as flowering and seeding remains largely unexplored in tree species, particularly of European forest systems. In this study, we are interested in analysing long-term data set on reproductive and vegetative growth of European tree species (mainly Quercus spp. and other widespread tree species) along a wide gradient of environmental conditions with the aim to solve the following objectives: i) to describe temporal changes in tree seed production across Europe using long-term data from LTER sites; ii) to identify which environmental factors or resources better explain the interannual variation in seed production (i.e., mast seeding); iii) to test the adaptive (the “resource matching”) vs. the nonadaptive (the “economy-of-scale”) hypotheses for masting for each of the selected sites; iv) to evaluate the magnitude of variation in seed production among sites as a function of their resource availability; and v) to detect recent changes in tree seed production that could be related with global change drivers (climate change, land use change, air pollution). Under a global change scenario, it would be expected that the drier conditions reinforce the negative effects of summer drought on seed production, especially in the most resource-limited ecosystems, leading to negative consequences for tree recruitment and forest dynamics.