ODDIE (OAK Drought DIEback)

National white oak health survey: characterizing the water balance of oak forests sampled & their initial crown condition according to recent drought events

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Collaboration : Département de la Santé des Forêts

Summary

Context — Intense and recurrent drought events have induced oak dieback in Europe for decades. In France, extreme soil water deficits occurred recurrently since 2015, with a great spatial variability among ecological regions. Anticipating a possible deterioration in the crown condition of French oak forests in the coming years, the French Forest Health Division (DSF) launched a national wide and innovative road sampling during the winter 2019-2020 to describe an initial health status of 85 oak forests in France.

Objectives — The present proposal aims at: (1) characterizing the long-term average water balance of each monitored oak forests; (2) quantifying the soil water deficit anomalies experienced by these different oak forests over the past 60; (3) detecting forests and ecological regions where drought events during years prior to the crown condition assessment already impaired their initial health status.

Approaches — The project will rely on two existing databases: the DSF database describing the health status of oak forests during the winter of 2019-2020 and the UMR Silva database quantifying the precocity, intensity and duration of drought events of French forests from 1959 to 2019. Anomalies of soil water deficit will be calculated for each oak forest monitored and links between crown condition and previous drought events will be explored. The relevance of the soil properties database used for water balance calculation will be evaluated in some forests using independent soil data.

Expected results and impacts — The project will also allow a new know-how transfer to our partner DSF, regarding the analysis of the spatial variability of drought events among forests distributed all over metropolitan France.