ST.06. Pósteres

ST.06-P-1

ZONA 2: Acceso Salas 1-2-3 - miércoles, 20 octubre

Linking plant physiological responses to changes on community structure under groundwater depletion

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Groundwater dynamics and water table level can greatly influence the physiological performance of plant species, the composition of vegetation, and ultimately ecosystem functioning. Understanding the ecophysiological processes involved in plant sensitivity to hydrological droughts is thus an important challenge. This is particularly relevant in seasonally dry semi-arid coastal dune ecosystems of the Iberian Peninsula, where human pressure is currently high, exacerbating climatic trends of groundwater scarcity.

We assess the sensitivity of coastal dune vegetation to the reduction of groundwater resources by exploring integrated trait syndromes in the dune ecosystem of Reserva Biológica de Doñana. We use correlations between physiological responses to water table depth and the abundance of different woody functional types to disentangle the mechanisms underlying species' abundance patterns. We consider leaf-level physiological data (leaf d13C, d15N, N and C content, Water-index, NDVI, PRI, CHL) and changes in community structure (cover, density) of 4 key woody species (Corema album, Erica scoparia, Pinus pinea and Juniperus phoenicea) along a groundwater gradient. We expect a physiological anticipating signal of further impacts of groundwater scarcity on groundwater-dependent species, and relevant thresholds of species changes driven by water table lowering. This will pave the ground to use simple physiological indices to trace the vulnerability of dune woody species to groundwater depletion.

ST.06-P-2

ZONA 2: Acceso Salas 1-2-3 - miércoles, 20 octubre

Energy-balance models for non-intrusive monitoring of tree water use of overaged oak coppices in response to different management strategies

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The ability of oaks to resprout quickly after cutting was exploited by a traditional forest management practice, known as coppicing. This traditional practice was abandoned since the 1960s, resulting in a high density of overaged individuals, less vigorous and particularly vulnerable. In the last decades, the Aragon Forest Services have promoted different thinning treatments in the area of El Moncayo, mainly to prevent forest fires and tree decline. Within the Project CO2PPICE, we will assess how these treatments may improve the provision of different ecosystem services. One of the specific aims is to quantify the effect on water balance of four alternative treatments (abandonment, conversion to high forest, coppice with standards and forest with pasture). Although studies on evergreen oaks and Mediterranean pines have shown that reduced stand density may increase water availability and deep percolation, this remains to be tested in deciduous Mediterranean oaks, much more profligate in the use of water. We anticipate that, under certain management scenarios, the increase of individual transpiration might compensate for the reduction in stand density. To test our hypothesis, we developed a custom-made system which delivers to the cloud continuous measurements of canopy temperature, air temperature and humidity, light environment, wind speed and soil water potential. With canopy temperature and environmental variables, transpiration rates are calculated according to an energy-balance model. Here, we will present the experimental set-up of the system, implemented under the different management regimes, and will discuss the first results for the growing season 2021.

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