Atmosphere – Vegetation – Groundwater interactions: A case study in the context of the subtropical coastal sandy mass aquifers from Eastern Australia

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The subtropical great sandy mass aquifers from South-East Queensland, Australia exhibit characteristic features such as high rainfall amounts, high infiltration rates, the presence of perched aquifers, and a marked seasonal and inter-annual climate variability. These particularities make these ecosystems of particular interest for investigating the close relation between vegetation and its hydrological environment.

Banksia is abundant on these islands in the form of different species; Banksia sp. are interesting to study because of their phreatotype behaviour and their adaptability to diverse Australian ecosystems.

This study is based on an instrumentation design strategy based on plots with increasing depths to groundwater from the freshwater-perched lake to higher up in the dunes. Each plot includes a monitoring system of the groundwater – vegetation – atmosphere system, including tree growth and water use.

We are collecting an intra-annual dataset showing a strong seasonal contrast between the subtropicals dry winter and the humid summer. This high-resolution dataset will help to understand mechanisms as well as inspire future modelling investigations.

We will present here the latest results of both monitoring and modelling based on this experimental study.