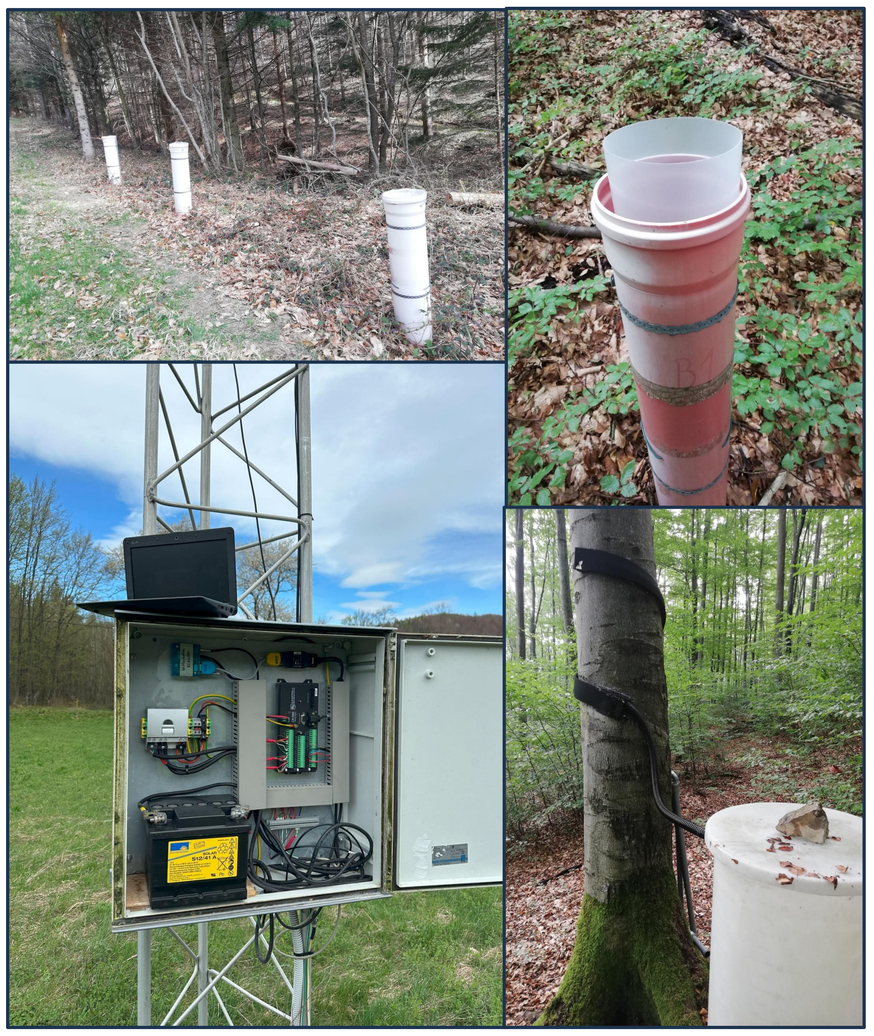
Free land precipitation regimes, forest stand precipitation regimes and stemflow rates on the ICP-forest core plot “Klausenleopoldsdorf”

In Austria forest condition monitoring has been implemented by the Federal Research Centre for Forests (BFW) in 1999. In this study the impacts of the dry years 2021 and 2022 on the precipitation regime of a beech stand are compared and interpreted based on long-term monitoring data of the Level II plot Klausen-Leopoldsdorf.



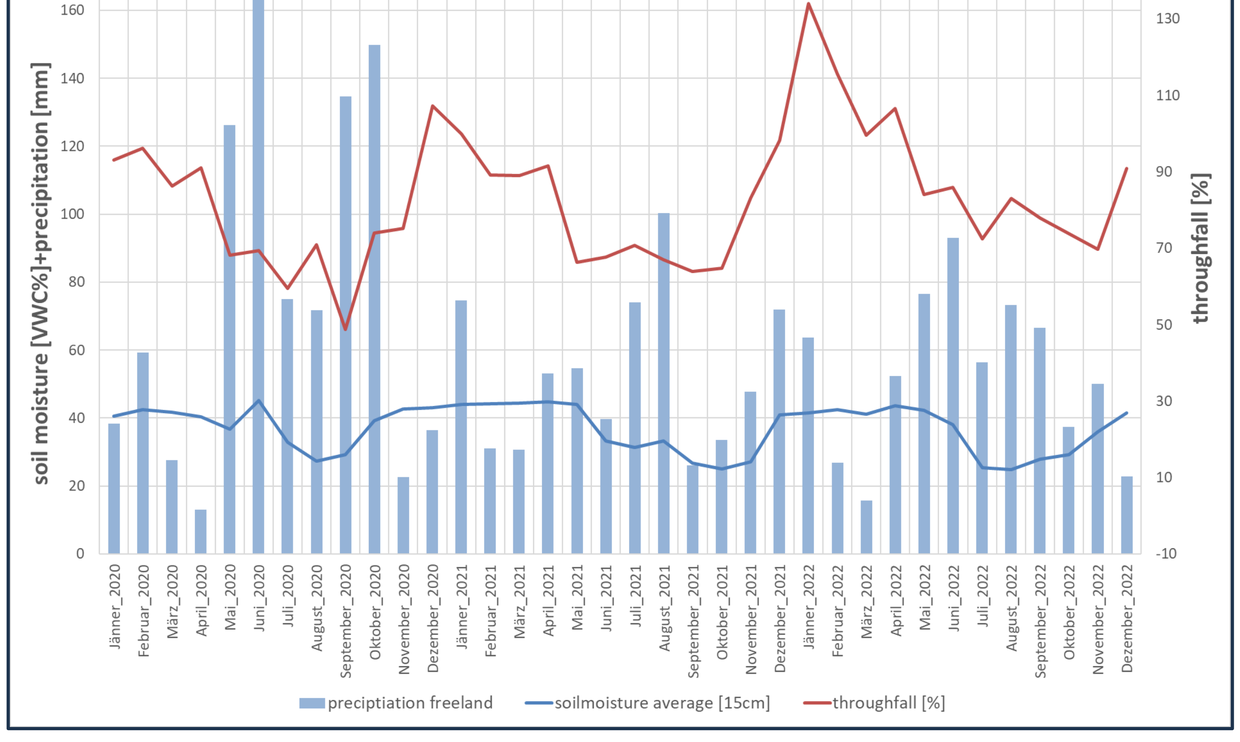
Observed area: **0.25 hectares**
Altitude: **510 m a.s.l.**
Mean precipitation: **799 mm***
Mean temperature: **8.92 °C***
*non-standardized or incomplete reference period

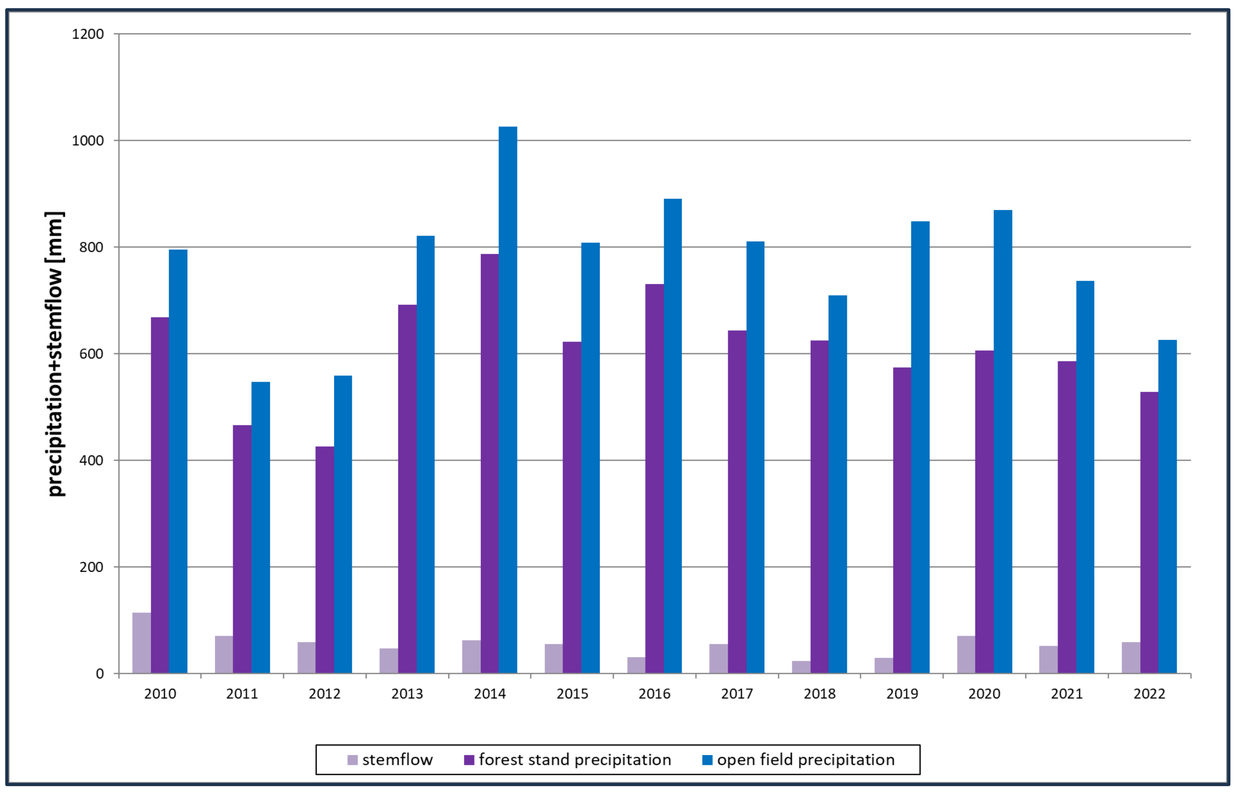
Measurement setup

1 weather station (Buchelbach-BFW)
1 weather station (Klausen-Leopoldsdorf-GEOSPHERE AUSTRIA)
15 forest stand precipitation collectors
3 open field precipitation collectors (within the forest stand)
3 stem flow collectors

Results

Total precipitation:
2020:974mm (GEOSPHERE), 919mm (BFW)
2021:630mm (GEOSPHERE), 638mm (BFW)
2022:584mm (GEOSPHERE), 635mm (BFW)





Conclusion

In forest ecosystems, precipitation is partitioned by the forest canopy into throughfall, stemflow and interception loss.

The phenological development of the forest stand is visible in the throughfall pattern and the soil moisture regime.

In dry years (2021-2022) these effects are clearly visible.

Such effects can only be detected by long-term measurements on permanent plots.

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