There was a sharp decline of monthly precipitation in spring (P) from 1950 to present. Mature maritime pine has been mostly affected by fall to winter P and recently. Since 1990, the accumulation of inauspicious years with insufficient stored water resulted in thinner wood cell walls and low ring width, which decreased the length of the growing season resulting in thinner wood cell walls and lower ring width, density and thus quality.

EFFECT ON WOOD GROWTH AND DENSITY

- Tree radial growth (TWG) positively responded to increased winter Pmax since the 1990s (Fig5). By contrast, the depletion of spring precipitation (P) had a growing negative impact on wood xylogenesis and density mostly since the 1990s (Fig5).

- P. pinaster's radial density (TWD) shows that trees mostly relied on spring precipitation of the current growing season at a juvenile stage (Fig 5).

- After trees turned 20 years old (~1980) wood xylogenesis and density was consistently and positively correlated to winter P and Pmax while negatively correlated to winter dryspells (Fig5). The significant correlations were mostly concentrated in winter preceding the ring formation, when xylogenesis is dormant [1] and groundwater recharge is needed to reach and use groundwater [4] down to 7m depth [5].

REFERENCES