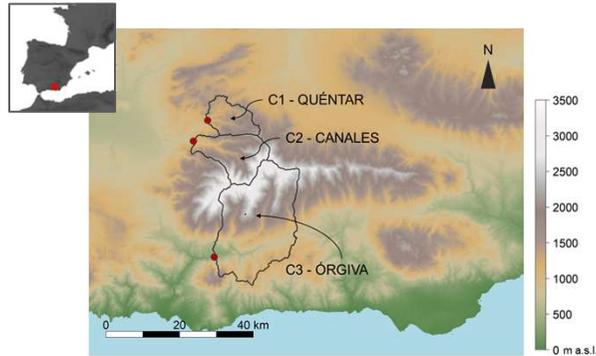


Linking snowline elevation changes and streamflow regime at the catchment scale: a study case in Sierra Nevada (southern Spain)

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Study Site



AIM: The aim of this work is to assess the evolution of snowline elevation, analyses their relation with the FSC and understand possible links with streamflow at three pilot catchment over Sierra Nevada Mountains (southern Spain)

Available Data

Remote Sensing Data

- 292 Landsat scenes
- Study Period: 2000-2020
- Derived variables:

FSC (Fractional Snow Cover derived from Spectral Mixture Analysis - Pimentel et al. (2017))

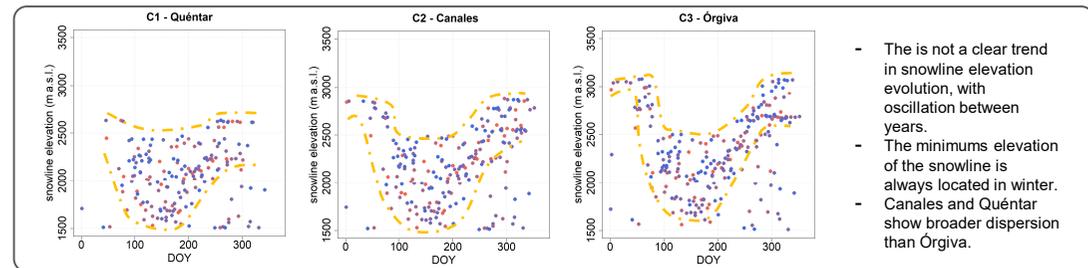
Snowline elevation (minimum elevation reach by the snow cover in the catchment at each date, derived using a DEM)

Streamflow Data

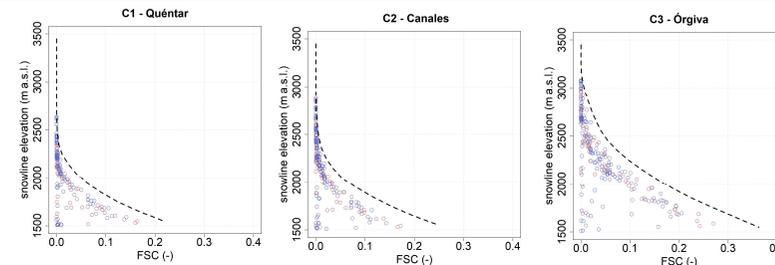
- 3 Catchments (Canales, Quentar and Órgiva)
- Study Period: 2000-2020
- Derived variables:

Q* (annual percentage of streamflow volumen)

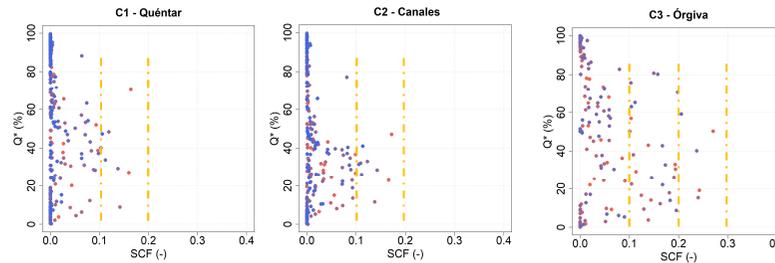
Results



- There is not a clear trend in snowline elevation evolution, with oscillation between years.
- The minimums elevation of the snowline is always located in winter.
- Canales and Quéntar show broader dispersion than Órgiva.



- There is a clear relationship between snowline elevation and FSC
- This relation does not follow the theoretical relation between elevation-FSC. Actual FSC is always smaller than the theoretical value.



- Snowline elevation can be derived from quasi-real time information
- FSC can be estimated using the above relationship
- Q* could be derived knowing the relations between and statistical distributions between FSC and Q*